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For members of **FRIENDS OF THE NATIONAL ZOO**
NOV | DEC | 2013

GOLDEN OPPORTUNITY

An international program to breed and conserve species started with the Zoo's golden lion tamarins.

» Maned Wolves
» Raucous Ravens
» Lighting Up the Zoo

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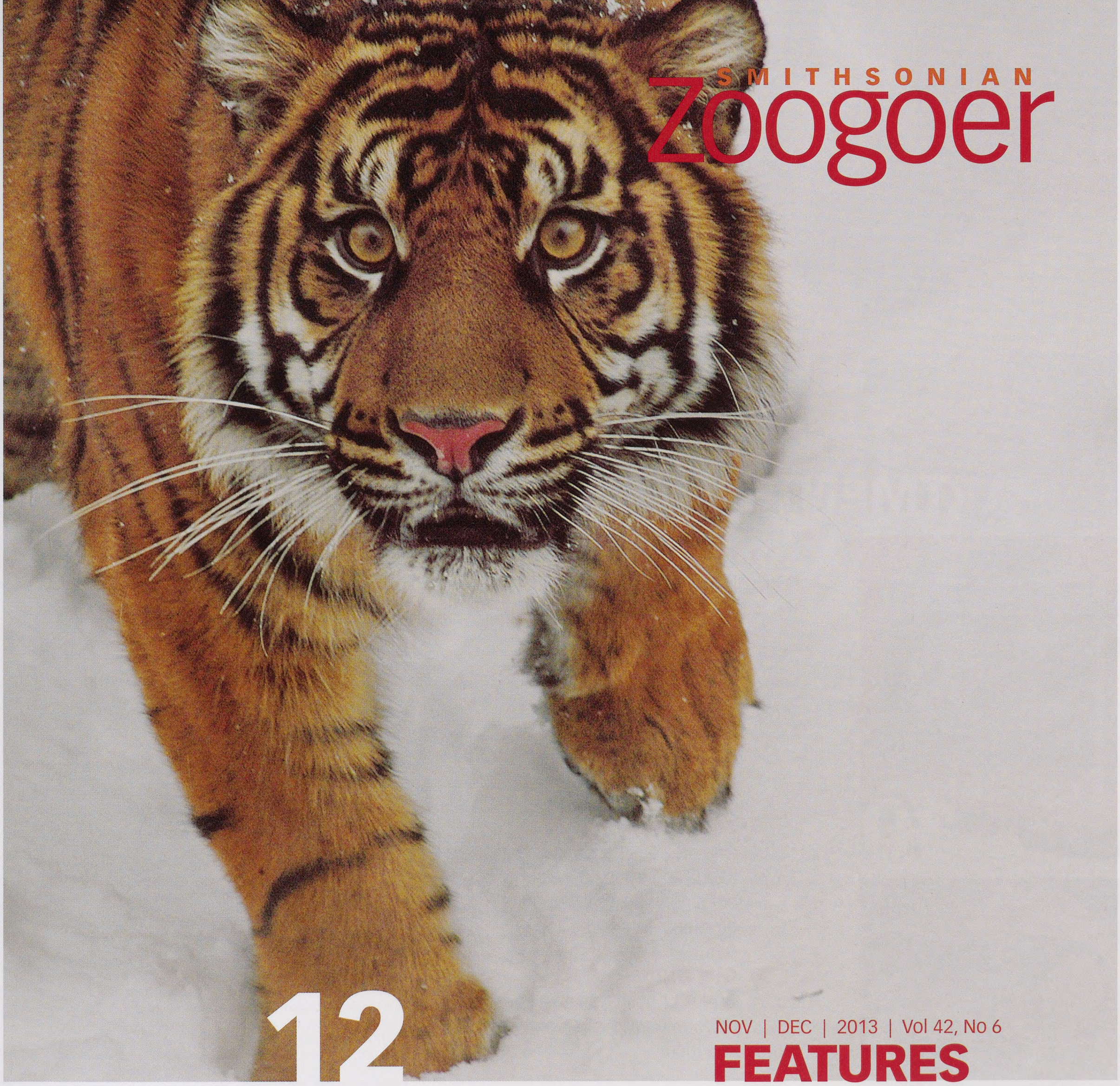

SMITHSONIAN
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J'NIE WOOSLEY

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CONNOR MALLON/NZP

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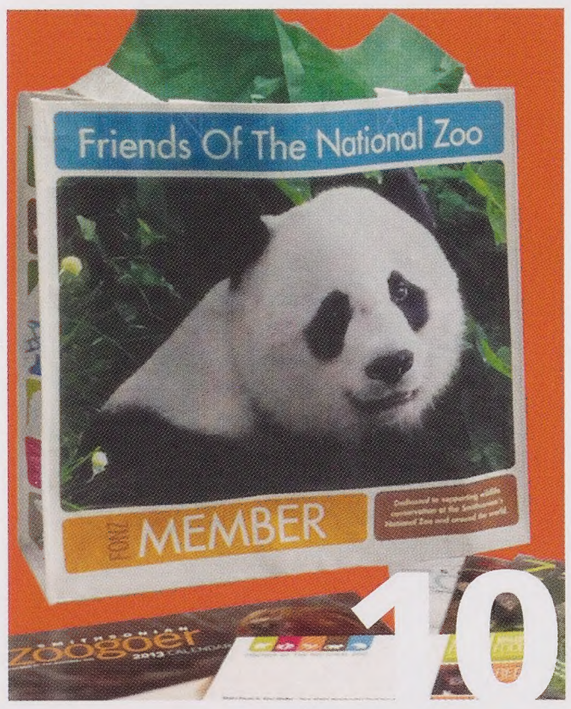

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FONZ Friends of the National Zoo is the dedicated partner of the Smithsonian's National Zoological Park. FONZ provides exciting and enriching experiences to connect people with wildlife. Together with the Zoo, FONZ is building a society committed to restoring an endangered natural world. Formed in 1958, FONZ was one of the first conservation organizations in the nation's capital.

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Smithsonian **National Zoological Park** is located at 3001 Connecticut Ave., N.W., Washington, D.C., 20008-2537. Weather permitting, the Zoo is open every day except December 25. For hours and other information on visiting the Zoo, go to **nationalzoo.si.edu.**

Membership in FONZ supports the animal care, conservation, and educational work of the Smithsonian's National Zoo. It also offers many benefits: a *Smithsonian Zoogoer* subscription, discounts on shopping and events, discounted or free parking, and invitations to special programs and activities. To join, call 202.633.2922, or visit **fonz.org/join.**

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Director's Circle	$2,500
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On the cover: Golden lion tamarins are among the many species to benefit from the AZA's Species Survival Plan.
PHOTO BY MEHGAN MURPHY/NZP

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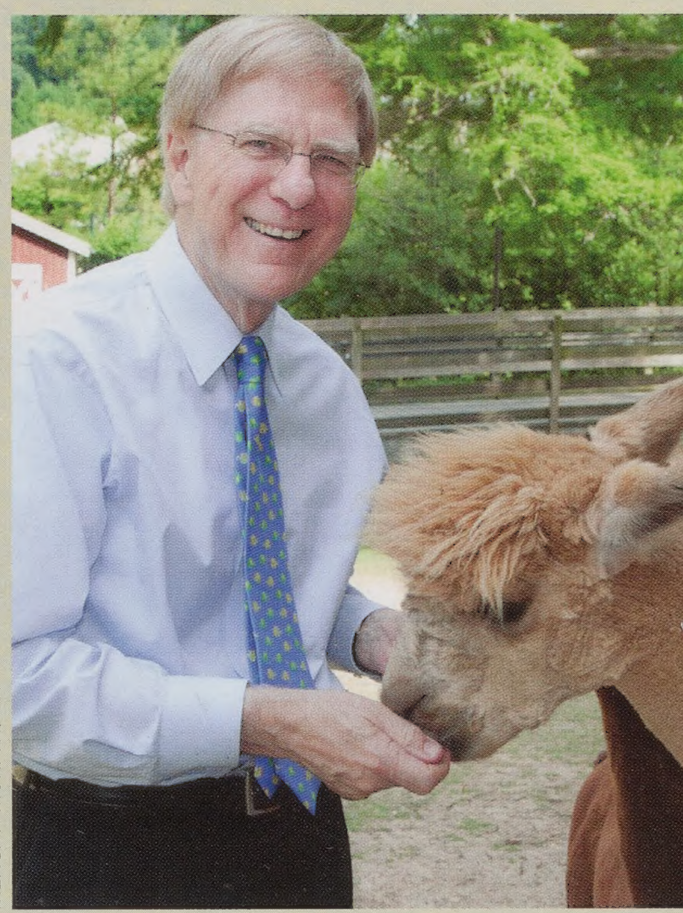
WITH A LITTLE HELP FROM OUR FRIENDS

WHAT A GREAT YEAR IT HAS BEEN! Since flipping the calendar to January 1, 2013, we have celebrated more animal births, arrivals, and departures than I can possibly include in this space.

The year started with the hatching of an endangered kiwi at SCBI, and the stream of births continued from there: two maned wolf pups, three clouded leopard cubs, dozens of black-footed ferrets, and more. At SCBI, scientists celebrated the birth of the very first Przewalski's horse born via artificial insemination. And, at the Zoo, keepers and visitors alike are still cheering the fall births of two tiger cubs and a panda cub.

The year was also a big one for newly-arrived animals and species. Bozie, the Zoo's newest Asian elephant, arrived in May. Rusty, the red panda, joined Shama in June. And Thor the sand cat is the first of his species to live here at the Zoo.



MEHGAN MURPHY/NZP

Along with these exciting arrivals, there were also fond farewells. The last of the Zoo's seven lion cubs departed for new homes—and eventual breeding opportunities—this past spring. Chaska, our female Andean bear born in 2010, left around the same time. And the two clouded leopard cubs born this year at SCBI also moved on to be paired with their future mates. While there is always some sadness when our animals depart for new homes, there is also happiness; we know it will help ensure their species' survival.

This list of successes for 2013 goes beyond animal births, arrivals, and departures. The amazing, new, state-of-the-art Elephant Community Center opened in March. Our seals—five new arrivals and the Zoo's elderly gray seal, Selkie—splashed into their new home on American Trail this spring. And the Zoo's popular Pizza Playground reopened after major renovations with a pizza party in June. Your membership gave you a first look at these new facilities and new animals throughout the year.

Many of these successes and triumphs were made possible because of your support. As you know, we exist to support and advance the Zoo. As FONZ members, your donations, purchases, and support of our classes, events, appeals, and other activities help us provide tangible support to the Zoo. For example, FONZ funded the transport of the Zoo's new Asian elephant, Bozie, from Baton Rouge to Washington, D.C., freeing the Zoo to use its budget elsewhere. That's no small feat!

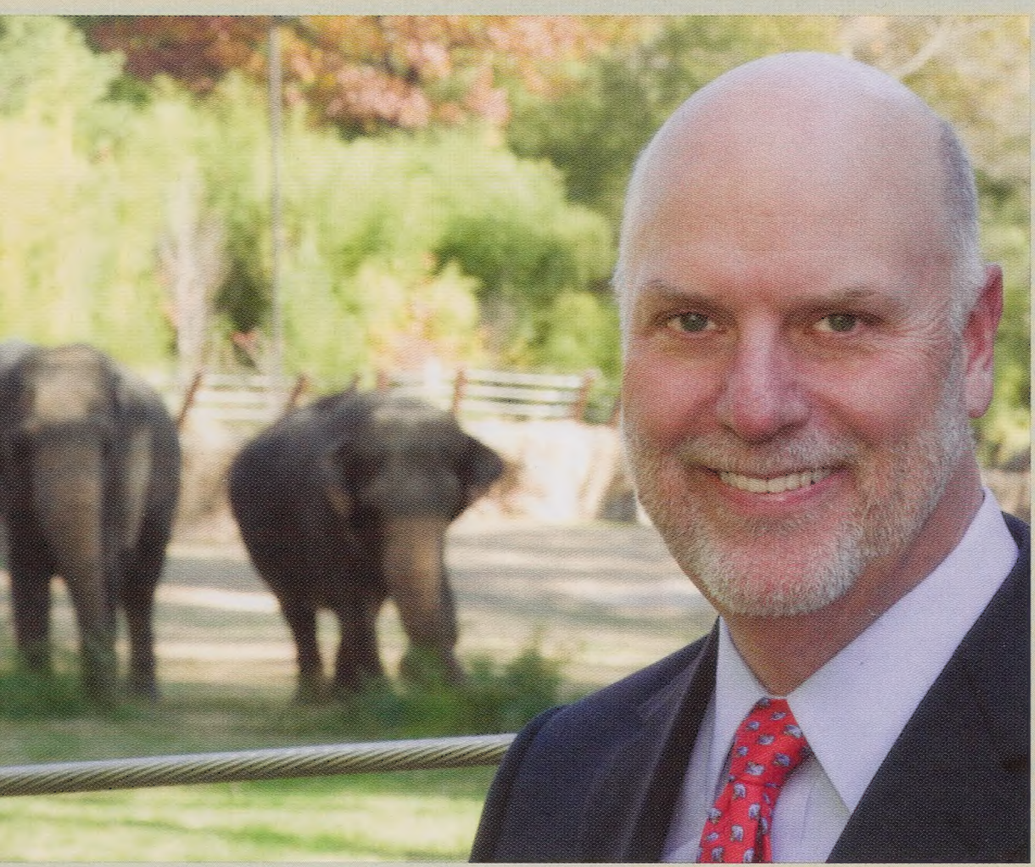
Now, as 2013 is drawing to a close, we are already looking ahead to 2014 and beyond. The Zoo will be celebrating its 125th anniversary next year and has big plans to create a new exhibit for the once endangered, uniquely American animal that inspired the creation of the Smithsonian's National Zoo in 1889: the bison. We are eager to help. And, with your help, we can. Please support our efforts by donating to our annual appeal to bring back bison (pp. 18-19), joining us for an upcoming event or class, or giving a gift membership this holiday season. Thank you for all you do for us.

Sincerely,

Bob Lamb

Bob Lamb
Executive Director, Friends of the National Zoo

STOP, LOOK, AND LISTEN



MEHGAN MURPHY/NZP

THOSE WISE WORDS, DRILLED INTO SCHOOLKIDS, ARE SAGE COUNSEL FOR MORE THAN CROSSING THE STREET. All of us stop, look, and listen as we move through each day. Here at the Smithsonian's National Zoo, that's how we check on the animals, guests, one another, and our work environment. And that's why the Association of Zoos and Aquariums (AZA) requires each member institution to undergo a rigorous accreditation process every five years. It blends thorough self-scrutiny with a painstaking inspection by experts.

The Zoo completed its latest accreditation application earlier this year. More than a year ago, our staff began compiling the reams of documentation needed to paint a complete picture of our work, and demonstrate that we meet the AZA's high standards for animal care. We also provided detailed information on our conservation work, research, educational and public outreach programs, membership, safety procedures, security, facilities, guest services, financial footing, and more. I'm proud to say that our entire staff contributed to this tremendous effort.

Gathering that material gave us a good, hard look at the Zoo. We took pride in the many things we do well, and we sought solutions to any problems that surfaced. The inspectors visited for a week this past May, examining every corner of our Rock Creek and Front Royal campuses. Our staff were magnificent at making themselves available for frank conversations with the inspectors. Before departing, our expert guests met with us to offer initial feedback. Needless to say, we listened attentively.

The inspectors' comments were overwhelmingly and gratifyingly positive. They noted dramatic improvements in our physical plant at both sites, marveled at the cleanliness and order behind the scenes of our animal exhibits, and praised the increased effectiveness of our communication—both internal and external—about our work. They also hailed our global leadership in conservation, research, and nutrition as well as our "spectacular" horticulture program.

That's not all. The inspectors saluted the strength and cross-Zoo integration of our exhibit development, animal training, and educational undertakings at all levels. They were especially impressed by the vigor of our American Association of Zoo Keepers chapter, which plays a key role in staff cohesion and development. And they deeply respected the Smithsonian's commitment to environmental sustainability.

Naturally, the inspection also revealed some areas for improvement. These were not surprises, and we've already begun addressing the issues. They include upgrading the functionality of our radio system, boosting security and fire prevention at SCBI Front Royal, fostering interdepartmental coordination during emergency drills, and improving pest management.

In September, the Zoo's leadership met with AZA's accreditation commissioners for a more formal review of the findings. I was thrilled, though not surprised, to learn that our accreditation has indeed been renewed, due to the hard work and excellence of our whole team: Smithsonian staff, FONZ employees, and volunteers.

This happy result is much more than a pat on the back. It's a signal to other AZA institutions, federal and state regulators, scientists, conservationists, and the public that they can trust us. It's a promise that we'll use the best practices possible in every aspect of our work.

You'll see the elephantine importance of our accreditation next spring. Three new female elephants will join our Asian elephant herd. They're coming south from Calgary Zoo, a fellow AZA institution. Having been through the same organizational marathon, keepers there knew that they could trust us to give their gray giants a good home. And so we shall, thanks to stopping, looking, and listening.

Sincerely,

Dennis Kelly
Director, Smithsonian's National Zoological Park

P.S. I'm sure you share our excitement over the panda cub. I'd like to take a minute and congratulate the extensive Zoo team who brought about this conservation success!

THREE PHOTOS: COURTNEY JANNEY/NZP

One Precious Panda

With a squeal of protest, Mei Xiang's newest cub was born at 5:32 p.m. on August 23. To the delight of everyone—staff, volunteers, FONZ members, and more—the cub appears to be healthy and robust, and is eating well. Mei Xiang is again proving to be the model panda mom that we know her to be. The cub—a female—received her first neonatal exam on August 25, and all signs indicate that she is doing well.

Mei Xiang gave birth to a second cub at 7:29 p.m. on August 24. Sadly, the cub was stillborn. After grooming it for 17 minutes, Mei Xiang allowed staff to remove the stillborn cub. A physical exam revealed that the cub had developmental abnormalities.

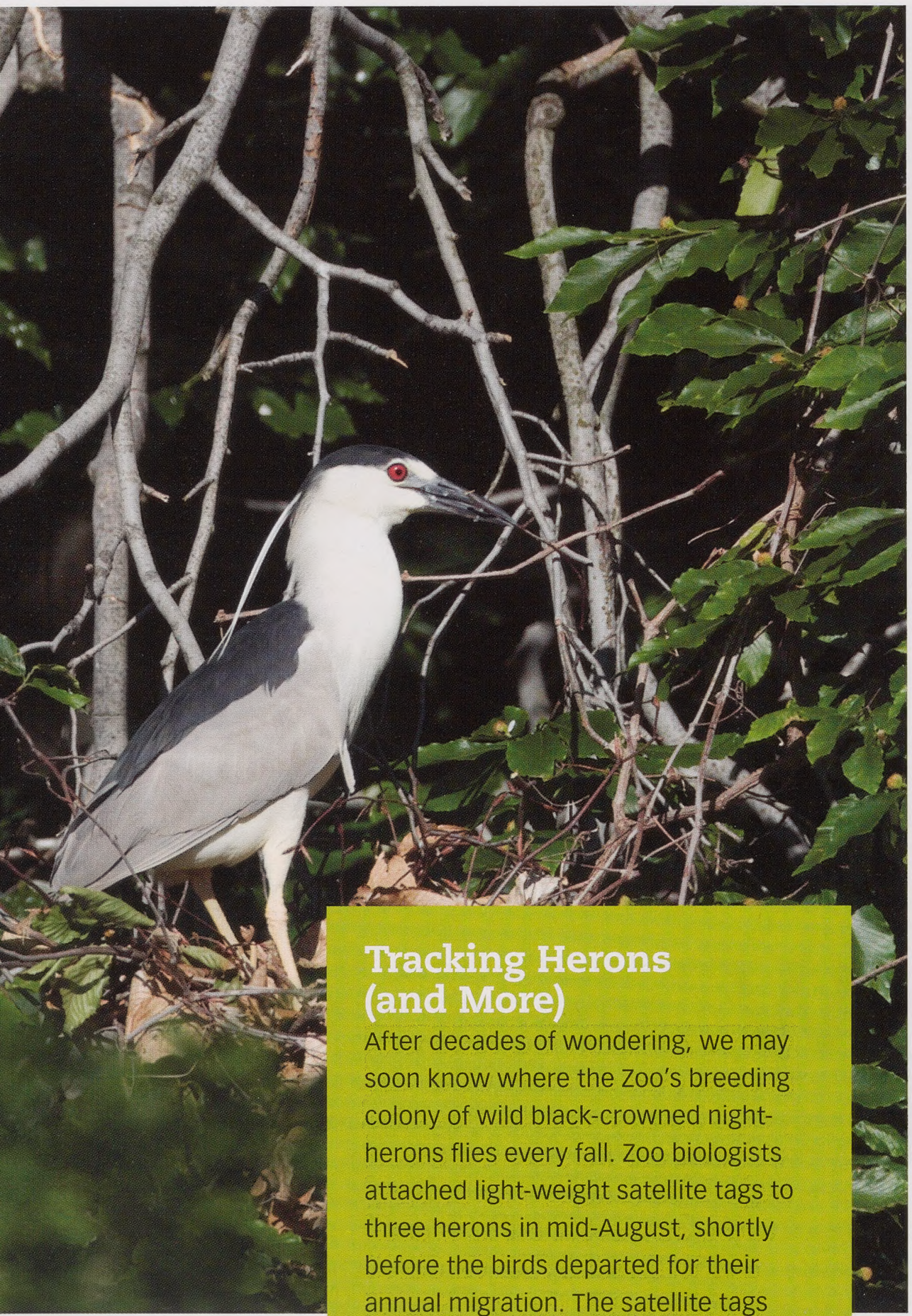
At birth, panda cubs are 1/900th the size of their mothers. No other non-marsupial mammals give birth to smaller newborns relative to their mother's size. Panda cubs open their eyes at six to eight weeks, and do not begin to explore until they are approximately three months old.

Watch Mei Xiang and her cub on the National Zoo app or on the Zoo's panda cams, sponsored by Ford Motor Company Fund: **fonz.org/pandacam.**

BARBARA STATAS

Fishing Cat Kitten on Exhibit—

Visitors to Asia Trail can now enjoy the antics of our newest fishing cat, Wasabi. Born on May 17, the young male had to wait until he'd had all his vaccinations before venturing outdoors. He now shares an enclosure with his mother, Electra, and the pair enjoy romping together when the curious kitten is not off exploring his new home. Mother and child head outside before 10 each morning and, weather permitting, usually remain on view until late afternoon.



MEHGAN MURPHY/NZP

Tracking Herons (and More)

After decades of wondering, we may soon know where the Zoo's breeding colony of wild black-crowned night-herons flies every fall. Zoo biologists attached light-weight satellite tags to three herons in mid-August, shortly before the birds departed for their annual migration. The satellite tags will transmit information about the birds' location, answering long-asked questions about their migratory path and winter feeding grounds. This isn't just to satisfy our curiosity; by learning where migratory species travel, we can better focus conservation efforts to protect the habitats they rely upon.

This project kicks off the Zoo's new Partners in the Sky program, which unites the Zoo with partners from the aerospace and satellite communications industries in an effort to better understand where and how migratory animals travel. Check back in future issues for more information about this exciting and innovative program.

Weaving New Webs

The Invertebrate Exhibit was spinning with exciting arachnid news this summer. In June, a new colony of golden orb weaver spiders arrived from the Woodland Park Zoo. Then, on July 23, hundreds of golden orb weaver spiderlings hatched from an egg case. These hatchlings will help restore the AZA population of golden orb weaver spiders, and will be distributed to new homes in the future. The Zoo is leading AZA's Safety Web for Arthropod Reproduction and Management (SWARM) program for these and related spiders, which is dedicated to maintaining healthy populations of these spiders in AZA institutions.

JESSIE COHEN/NZP

MEHGAN MURPHY/NZP

New Hope for Przewalski's Horses

The Przewalski's horse filly born July 27 at the Smithsonian Conservation Biology Institute headquarters in Front Royal represents a gigantic step forward in efforts to breed the world's last wild horse species; she is the first of her species to be born following artificial insemination. The foal's birth is the culmination of seven years' research by SCBI reproductive physiologist Budhan Pukazhenthi and others. This successful birth is likely to be the first of many via artificial insemination, which allows biologists to breed females to genetically valuable males without transporting one or both individuals to a mutual location. Przewalski's horses are native to the steppes of central Asia, and were declared extinct in the wild in 1969. Since then, biologists around the world have worked together to breed the species in captivity, and reintroduce populations to the wild. At present, approximately 1,500 Przewalski's horses live at zoos and other facilities around the world. Another 300-500 individuals live wild in China, Mongolia, and Kazakhstan, where reintroduction efforts have been focused.

DOLORES REED/NZP

BILL QUAYLE/CALGARY ZOO

Trumpeting Three New Elephants

The Smithsonian's National Zoo's elephant herd is about to nearly double, with three female elephants set to arrive in spring 2014. All three elephants hail from Calgary Zoo. Kamala and Swarna were both born in Sri Lanka in 1975, where they temporarily lived together at the Pinnawala Elephant Orphanage before moving to the Calgary Zoo in 1976. Maharani, the youngest, was born at Calgary Zoo on July 14, 1990, to Kamala. All three have lived together since then.

The three elephants are expected to arrive at the Smithsonian's National Zoo sometime in the spring of 2014. Following a quarantine period of at least 30 days, they will begin to meet the Zoo's four elephants—females Shanthi, Ambika, and Bozie, and male Kandula—before joining the herd. Their arrival will be a bit of a family and friend reunion: Kamala's first-born calf, Chanda, is Kandula's father, making her Kandula's paternal grandmother. And, while they are probably not related, records indicate that Kamala, Swarna, Bozie, and Shanthi all lived at the Sri Lankan Pinnawala Elephant Orphanage during the same time period.

The Zoo's newly-finished Elephant Trails exhibit can comfortably house eight to ten adult elephants and their calves. With the arrival of Kamala, Swarna, and Maharani in spring 2014, the Zoo's herd will include seven elephants and will more closely mimic the multi-generational social groups found in the wild.

ABBY WOOD/NZP

CORAL COLLECTION

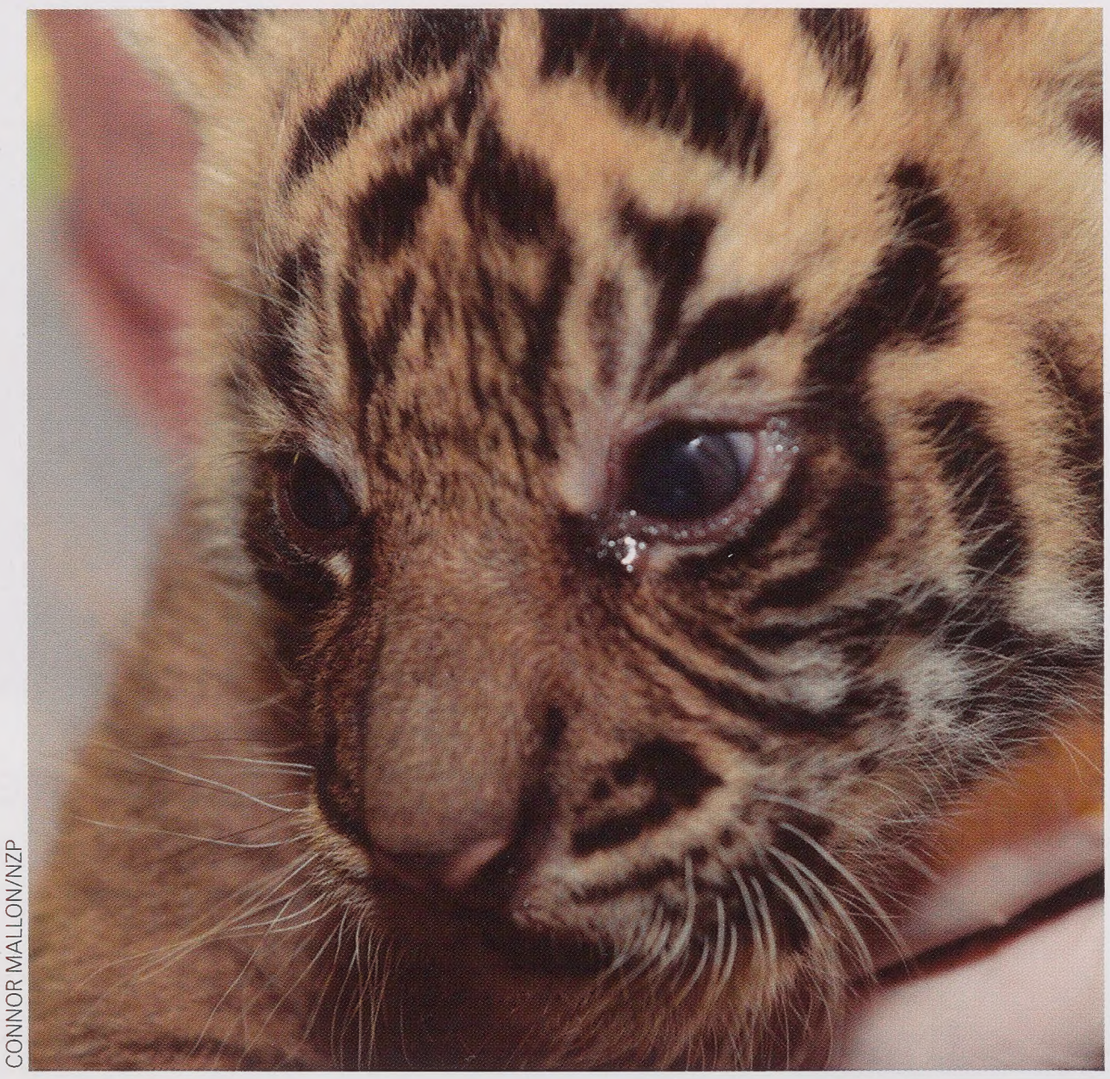
Although they look a bit like plants, corals are actually animals. They are distantly related to anemones and sea jellies, often eat zooplankton and other small animals, and breed only once a year. This summer, Zoo biologist Mike Henley was in Belize for the elkhorn coral breeding season. He collected coral larvae and brought them back to the Zoo's Invertebrate Exhibit. There, Henley will raise the young corals as an insurance population, ready to repopulate wild reefs if coral populations decline or go extinct.

TWO TINY TIGERS

AUGUST 5 BROUGHT EXCITING NEWS TO LION/TIGER HILL: THE BIRTH OF TWO HEALTHY AND ACTIVE TIGER CUBS. The cubs—a male and a female—were born to first-time mother Damai, and are the first Sumatran tigers to be born at the Smithsonian's National Zoo since 2006, when Guntur and his two brothers were born to mother Soyono. The cubs had their first health exam on August 26. "The cubs are plump and healthy, and we couldn't be happier," says curator Craig Saffoe, who reports that each cub appears to have a distinct personality. "The male cub is calm and quiet, while the female is vocal and feisty."

Sumatran tigers are critically endangered in the wild, where they are threatened by habitat loss and poaching. Their wild populations continue to decline as Sumatran forests are clearcut to make way for oil palm and *Acacia* plantations. Scientists estimate that there are approximately 500 Sumatran tigers in the entire world.

The cubs will be out on exhibit by early- to mid-November. In the meantime, visitors can see the cubs' father, Kavi, at Lion/Tiger Hill.

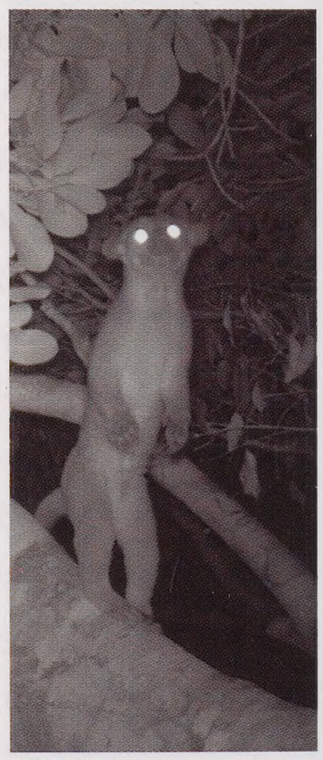


CONNOR MALLON/NZP

TOM AKRE/NZP

SCBI Takes the Gold!

The new SI-Mason Academic Center is worthy of gold, according to the U.S. Green Building Council, which just awarded the new building with LEED Gold certification. The certification recognizes SCBI's focus on sustainable practices in the design and construction of the building, which features state-of-the-art laboratories, classrooms, green roofs, rainwater gardens, dormitories, a dining hall, and a distance-learning center. These facilities offer students a one-of-a-kind opportunity to live and learn at the Zoo's world-class conservation and research center. The new SI-Mason Academic Center is the first LEED for New Construction Gold certified building project anywhere within the Smithsonian.



SCBI Scientist Receives Luis F. Barcardi Award

Congratulations to SCBI conservation biologist Tremaine Gregory, who received the 2013 Luis F. Barcardi Award for outstanding conservation-related presentation by a young post-doctoral researcher at the Association of Tropical Biology and Conservation annual meeting. Gregory's award-winning presentation discussed her current research into the use of natural treetop bridges as a way for arboreal animals to cross natural gas pipelines in Peru. Through the use of motion-triggered camera traps, Gregory has already collected more than 7,000 photos of 19 different species using the arboreal bridges to cross pipeline right-of-ways. Hydrocarbon exploration and extraction is expected to increase throughout the region in the coming decades. Gregory's research may provide essential insight into the conservation of primates and other arboreal species that are affected by construction and pipelines.

Celebrating Our Award Winners!

Zoo staff collected an impressive array of awards from the American Association of Zoo Keepers (AAZK).

Small Mammal House keeper Kenton Kerns received the Lutz Ruhe Meritorious Achievement Award for Professional of the Year in recognition of his work to advance animal care, promote public awareness, enhance professional development, and contribute to local and global conservation.

Lauren Augustine, a keeper at the Reptile Discovery Center, was awarded the Certificate of Merit in Conservation in recognition of her conservation work at the Zoo and beyond.

Asia Trail keeper Stacey Tabellario, American Trail keeper Rachel Metz, nutrition biologist Heather Baskett, and exhibit developer Judy Tasse are the Zoo's Enrichment and Training Steering Committee, and the joint recipients of the Lee Houts Excellence in Enrichment Award.

Since its inception, the National Capital AAZK Chapter has been committed to offering keeper education and professional development opportunities at the Zoo. In recognition of this commitment, the entire chapter is the 2013 recipient of AAZK's Certificate of Merit for Zoo Keeper Education.

Congratulations to all the 2013 AAZK award winners!

Mark Your Calendar

Oct. 24 **FONZ MEMBER MEETING**—Get an insider's update on our pandas, tigers, and more! **Fonz.org/annualmeeting**

Oct. 25-27 **Boo at the Zoo**—Come to the Zoo for the wildest trick-or-treat experience in town. Enjoy animal encounters, keeper talks, and more along with candy and snacks. **Fonz.org/boo**

Oct. 30 **Night of the Living Zoo**—Join us for our adult Halloween bash! **Fonz.org/nolz**

Nov. 2 **American Wildlife Day**—Join us on the American Trail for a day filled with animal demonstrations, keeper talks, and family-friendly activities featuring sea lions, wolves, beavers, and other North American species. FREE.

Nov. 29–Jan. 1, (except Dec. 24-25) **ZooLights, powered by Pepco**—ZooLights is brighter than ever! More than 500,000 environmentally-friendly LED lights transform the Zoo into a winter wonderland with lit animal silhouettes, musical light displays, and a new garden scene! FREE. **Fonz.org/zoolights**

Thank you to all of our corporate sponsors! With your support we are able to provide much needed funding for critical Zoo programs. Our sponsorship opportunities provide a unique way for organizations to improve their visibility in the community and be associated with our award-winning science and conservation projects. Our multi-channel recognition programs maximize the exposure of your brand. Find out more about how you can pollinate your company's reach by calling 202/633-3046 today. **Partnership with Friends of the National Zoo—SWEET!**

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WILD & WONDERFUL Gifts!

Turn your holiday celebrations into a roaring good time with gifts from FONZ and the Smithsonian's National Zoo.

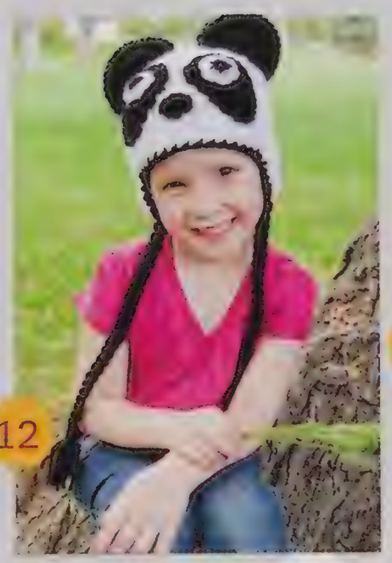
6

7

FONZ GIFT MEMBERSHIPS

Fit an entire zoo into your holiday packages with the gift of a FONZ membership. Gift recipients receive a stunning 2014 FONZ calendar, a subscription to *Smithsonian Zoogoer*, and access to one-of-a-kind member-only events and discounts. Some membership levels even include free parking at the Smithsonian's National Zoo!

Available online:
fonz.org/giftmembership



WRAP UP SOMETHING WILD

Shop our online store for the wildest selection of gifts this holiday season. Hundreds of gifts available, including:

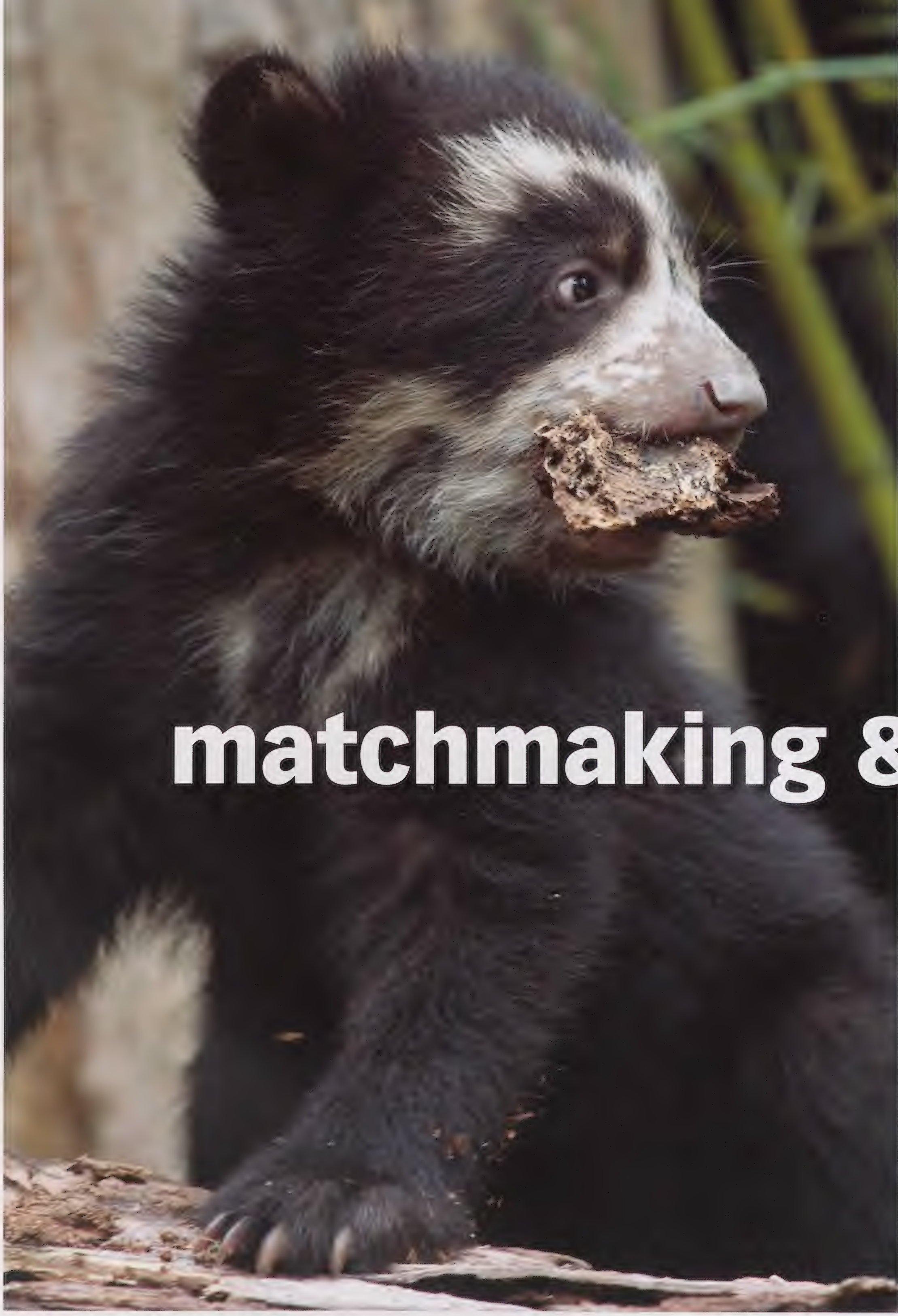
1. Panda Cub and Cherry Blossom Glass Ornament
2. Red Panda Plush
3. Fallin' in Love Panda Cub Mug
4. Giant Panda iPhone 4/4S/5 Case
5. Panda Lunch Bag
6. Panda Plush
7. Giant Panda Italian Marble Coaster
8. Rusty the Red Panda Long Sleeve Shirt
9. Fallin' in Love Panda Cub T-shirt
10. Tiger and Cubs Long Sleeve Shirt
11. Mei Xiang the Giant Panda Hoodie
12. Giant Panda Hat
13. Baby Owl Hat
14. Watermelon Tourmaline Leaf Necklace
15. Pretty Parrot Vintage Necklace
16. Wooden Animal Alphabet Puzzle

Shop online:
fonz.org/shop

ADOPT A SPECIES

Lions and tigers and panda bears (and more)! Give your animal-loving friends and family the gift of species conservation this holiday season. More than a dozen species are available for adoption. Various packages are offered; adoption packages of $65 and up include a free plush of the adopted species.

Available online:
fonz.org/adopt



matchmaking &

MEHGAN MURPHY/NZP; Facing page: JIM JENKINS

species saving

BY BRITTANY STEFF

Across North America and around the world, zoos and aquariums band together to ensure the survival of species large and small.

Earlier this year, Zoo Atlanta celebrated the birth of twin panda cubs. In June, the Denver Zoo welcomed a Grevy's zebra calf. And, in April, the Buffalo Zoo cheered the birth of Alex, a prehensile-tailed porcupine. None of these were National Zoo births, but they are all good news for our Zoo because they directly benefit a program that's close to the heart of the Zoo's mission: the Species Survival Plan.

Species Survival Plan programs are the Association of Zoos and Aquariums' answer to the question: "How do zoos protect species and ensure healthy populations in zoos and in the wild?"

Historically, zoos acquired most of their animals from the wild. Then, as concerns arose about declining wild animal populations, zoos turned toward another solution: captive breeding. In theory, this is perfect. In practice, it can be extremely difficult. Most zoos do not have the space required to support the number of animals necessary for maintaining a genetically healthy population. Then there's the problem of what to do when you breed more animals than you need—or even have room for. Zoos started trading and selling animals to one another, shuffling them around like baseball cards. But this wasn't sustainable either. Zoos couldn't operate alone—they needed to work together.

Live Long and Prosper

That's where the Association of Zoos and Aquariums (AZA) comes in. They started the Species Survival Plan (SSP) program in the early 1980s based on a model created for golden lion tamarins at the Smithsonian's National Zoo. SSP programs provide the framework for how zoos collaborate

FACING PAGE: Andean bear cubs are adorable, playful, and the result of careful planning.
THIS PAGE: International cooperation is essential when breeding kiwis and many other species.

Bringing Home Bobcats

Each SSP is different, tailored to the needs of its species. And not all SSPs focus on breeding. Bobcats, for example, are native to North America and aren't endangered. They don't need a captive breeding program. However, numerous orphaned, injured, or otherwise unreleasable bobcats find their way to wildlife rehabilitation centers every year. The AZA's bobcat SSP helps find these animals permanent homes.

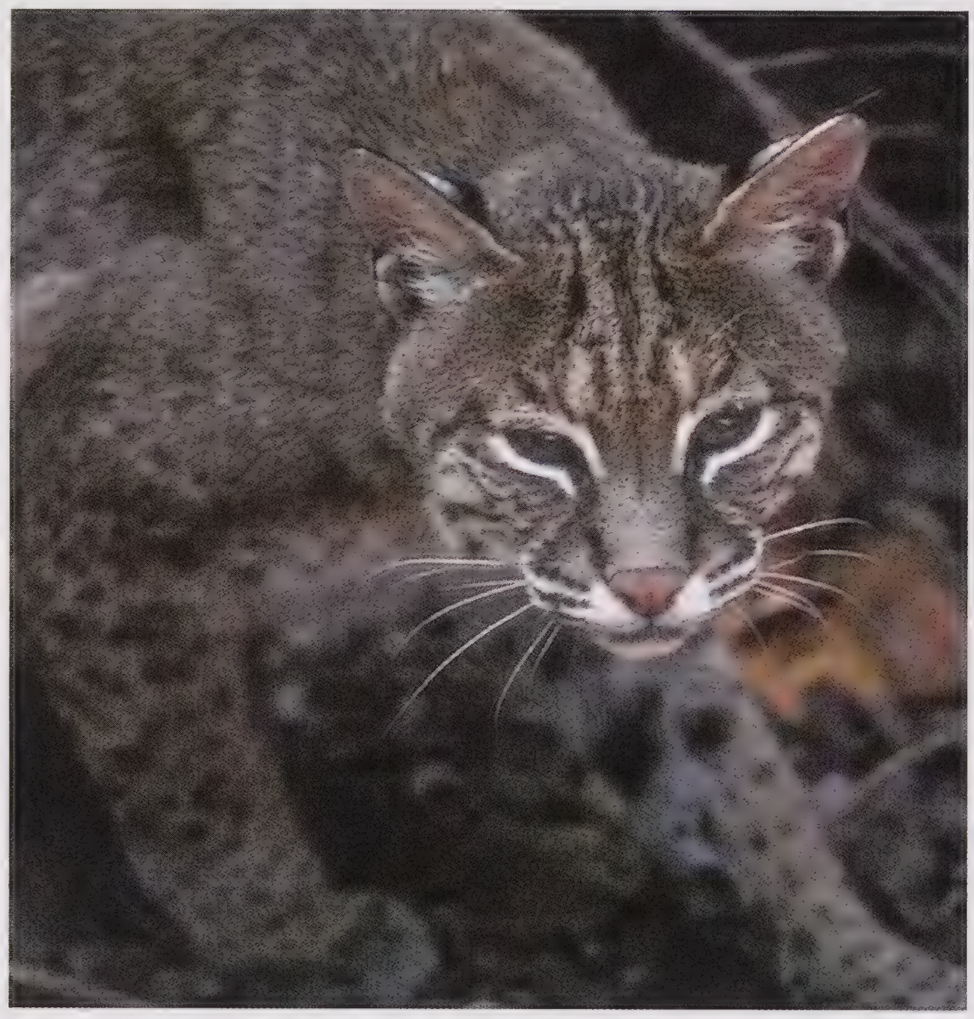
Following rehabilitation, bobcats that cannot survive in the wild are often moved to zoos. Great cat keeper Rebecca Stites is the coordinator and studbook keeper for the newly-formed bobcat SSP.

"What I love most," Stites says about her work with the bobcat SSP, "is that we get to work with rescue groups around the country to find homes for animals that couldn't be released. We're providing these animals with full and enriching lives, while also educating our visitors about bobcat behavior and biology."

Recently, Stites was able to bring three bobcats to the Smithsonian's National Zoo. These bobcats, males Yoda and Cheeze and female Ollie, came to the Zoo from the National Bobcat Rescue and Research Foundation in Texas. All three are now on exhibit on Lion/Tiger Hill, just across from the caracals.

on conservation and breeding initiatives. Species by species, SSPs are the arbiters on which animals should breed, which animals should move, and what, in general is best for a particular species.

"SSPs are how zoos all across the country work together to make sure we always have animals in our collections," says Brandie Smith, senior curator at the Smithsonian's National Zoo and former vice president of animal conservation at AZA, where she oversaw the SSP program. "They're also the way we make sure we don't have too many animals."



JESSIE COHEN/NZP

The scope of SSPs varies widely. Some, such as the Andean bear SSP, manage zoo populations in North America alone. Others, including the giant panda and red panda SSPs, are international in scope, managing animals in zoos and breeding facilities all over the world. And some, like the golden lion tamarin SSP, even track animals in the wild.

All SSPs are managed by one or two elected volunteers: the SSP coordinator and the SSP studbook keeper. (In some SSPs, the studbook keeper and the SSP coordinator are the same person.) The coordinator runs each SSP and acts as the zoo community expert on that particular species. Meanwhile, the studbook keeper manages a document that tracks every individual in the zoo population: It's both a family tree and a complicated address book of who lives where. Some SSPs may also include advisors on genetics, nutrition, veterinary care, reproduction, conservation, or anything else the coordinator believes will help the species survive and thrive in zoos. SSPs are a way of making a small, intimate circle out of the larger zoo community.

Every one, three, or five years (depending on how fast the species breeds and ages) the studbook keeper and SSP coordinator meet to create, review, and update a master plan for the species. They look at every single animal at each AZA institution. Then, with the help of population biologists at the AZA's Population Management Center at Chicago's Lincoln Park Zoo, they analyze the genetics of each animal. Based on the genetics of potential parents and their hoped-for offspring, the team drafts a Breeding and Transfer Plan for their SSP. The plan outlines breeding recommendations and any relocation plans necessary to create the best pairings. It's as if online dating sites made dating recommendations based on your genome, and then went ahead and contacted moving companies.

"Genetics start the discussion," Smith says, "but SSPs also consider practicality, logistics, husbandry, welfare, and even the animals' personalities."

The goal is to create sustainable, genetically healthy populations. The gold standard is a population that will last 100 years, or 10 generations, with 90 percent of its genetic diversity intact.

Giving to Receive

The two Sumatran tiger cubs, born at the Zoo on August 5, 2013, are an excellent example of an SSP in action.

Zoo staff worked with the Sumatran tiger SSP to negotiate the arrival of a genetically valuable pair of tigers: Damai, a young female from the San Diego Wild Animal Park, and Kavi, a male from Zoo Atlanta. In order to make space for the young couple, and as part of the agreement with the SSP, we sent Guntur (born here in 2006) to Japan, where he will boost the

The studbook keeper manages a document that tracks every individual in the zoo population: It's both a family tree and a complicated address book of who lives where.

The Zoo's zebras are all studs—literally. The Zoo is a bachelor pad for young male zebras who haven't yet been paired with potential mates.

MEHGAN MURPHY/NZP

The greater rhea SSP is one of many managed by a keeper at the National Zoo.
FACING PAGE: Every single species of the so-called great cats—lions, tigers, leopards, and jaguars—is managed by an SSP.

MEHGAN MURPHY/NZP

genetic diversity of their Sumatran tiger population.

"With the tigers, we worked with the SSP over a period of years to get a good pair of genetically valuable tigers for breeding," says Smith. "Part of this cooperation actually involved sending one of our animals overseas. Because we cooperated with the SSP and Japan, we were able to welcome two tiger cubs."

The Good of the Many

Sometimes, SSP plans and participating institutions focus on deliberately not breeding. Because, while baby animals are cute, baby animals also grow up.

"One of the most important issues in zoos is managing our space," Smith says. "We have to make sure that we don't create too many babies, that we can manage our space and our animals wisely."

For this reason, an institution's role in an SSP may be to serve as a holding facility for non-breeding animals. Alert Zoo visitors might note that we never have baby zebras, for example. That's because our role in the Grevy's zebra SSP is to be a bachelor pad for young males.

In the wild, male zebras live alone. Managing testosterone-charged animals that are by nature solitary, and by temperament moody, is a challenge. But the Smithsonian's National Zoo is experienced at keeping male zebras together safely, so that's what we do: We house young males that either stay with us indefinitely or go on to breed at other zoos, according to SSP recommendations. Though we will never have cute zebra calves, we are helping the species.

That spirit of cooperation is what makes the SSP program such a success.

Striking Gold

SSPs aren't exclusively concerned with animals in zoos. Many also conduct important conservation and research on animals in the wild.

As the program that inspired and launched the SSP program, the golden lion tamarin SSP is a prime example. Golden lion tamarins are small, endangered

monkeys native to South America. In the 1970s, the species faced extinction, and zoos struggled with high rates of infant mortality when they attempted to breed their animals. The Smithsonian's National Zoo was instrumental in solving this problem by discovering that male golden lion tamarins are active and essential parents to their young. Prior to this discovery, keepers had been removing fathers from enclosures after their babies were born. Infant mortality rates plummeted when keepers began leaving males with their mates and offspring.

Small Mammal House keeper Kenton Kerns explains that scientists quickly ran into another problem. "Once you get golden lion tamarins to breed, you can't stop them. They're such good breeders, and they often have twins, so you are usually getting two at a time."

With this surplus of tamarins, scientists decided to try reintroducing them to their native habitat in Brazil. Thanks to the efforts of the Smithsonian's National Zoo, and lessons learned from our golden lion tamarins, 153 golden lion tamarins were reintroduced to their native habitat between 1984 and 2007. While reintroductions are currently on hold due to a shortage of suitable habitat, the golden lion tamarin SSP continues to track the movements and genetics of tamarins, both in the wild and in zoos.

Study Groups

SSPs also make it easier to conduct research, something that may otherwise be difficult for some institutions. "At the Smithsonian's National Zoo, we're a leader in conservation and science," says senior curator Brandie Smith. "But smaller zoos don't always know how to get involved in conservation or research."

Additionally, researchers often need data and support from more than one zoo to complete a research project. It's a numbers game. Most zoos simply do not have enough individual animals of any one species to support a rigorous, statistically significant scientific study. Once an SSP has vetted and approved a research project, it's much easier for researchers to partner with zoos and receive grants.

The Smithsonian's National Zoo participates in SSP-supported research on kori bustards, rheas, lions, tigers, and a wide variety of other species.

JESSIE COHEN/NZP

The Smithsonian's National Zoo participates in SSP-supported research on kori bustards, rheas, lions, tigers, and a wide variety of other species.

Breeding Without Borders

SSPs foster relationships between zoos and aquariums in the United States, and they're starting to foster international relationships as well.

"Global cooperation is the future of zoos," says Bird House biologist Sara Hallager, who is SSP coordinator and international studbook keeper for the kori bustard. "Everybody is realizing that these populations aren't sustainable when managed individually. We really need to work globally."

Hallager tracks koris in zoos in Europe, Africa, and the Middle East in addition to North America. Though kori bustards aren't endangered, they are close relatives of the great Indian bustard, a critically endangered species. Lessons learned through the kori bustard SSP may help save its cousin species.

Global cooperation has been key to the survival of another bird in zoos: the kiwi. In the late 1980s, the population of kiwis in zoos outside of their native New Zealand was floundering. National Zoo Bird House keeper Kathy Brader flew to New Zealand to see what could be done. New Zealand had previously kept the studbook for all kiwis globally. In a rare move, they agreed to hand over the management of kiwis outside New Zealand to the SSP program, and to Brader personally.

Now, as a result of Brader's efforts, the non-New Zealand kiwi population has grown from a couple of dozen birds at six zoos to 53 birds at 13 zoos, an all-time world high. This success was only possible through international cooperation, says Brader. "We need Europe, and they need us, and we all need New Zealand. The only way this can work is if we all cooperate."

The movement toward global cooperation mirrors the push for national cooperation that spurred the initial creation of the AZA's SSP program. Zoo professionals and conservationists the world over hope this cooperation means that populations of species in zoos and in the wild will remain healthy, sustainable, and secure.

"The amazing thing about SSPs is that all these zoos voluntarily work together," says Smith. "They sacrifice their individual gain for the greater good. These hundreds of zoos move thousands of animals, and we all work together to make sure there are animals for generations to come." SZ

— *Science writer* BRITTANY STEFF *is an editor for the Zoo's website and veteran* Smithsonian Zoogoer *contributor.*

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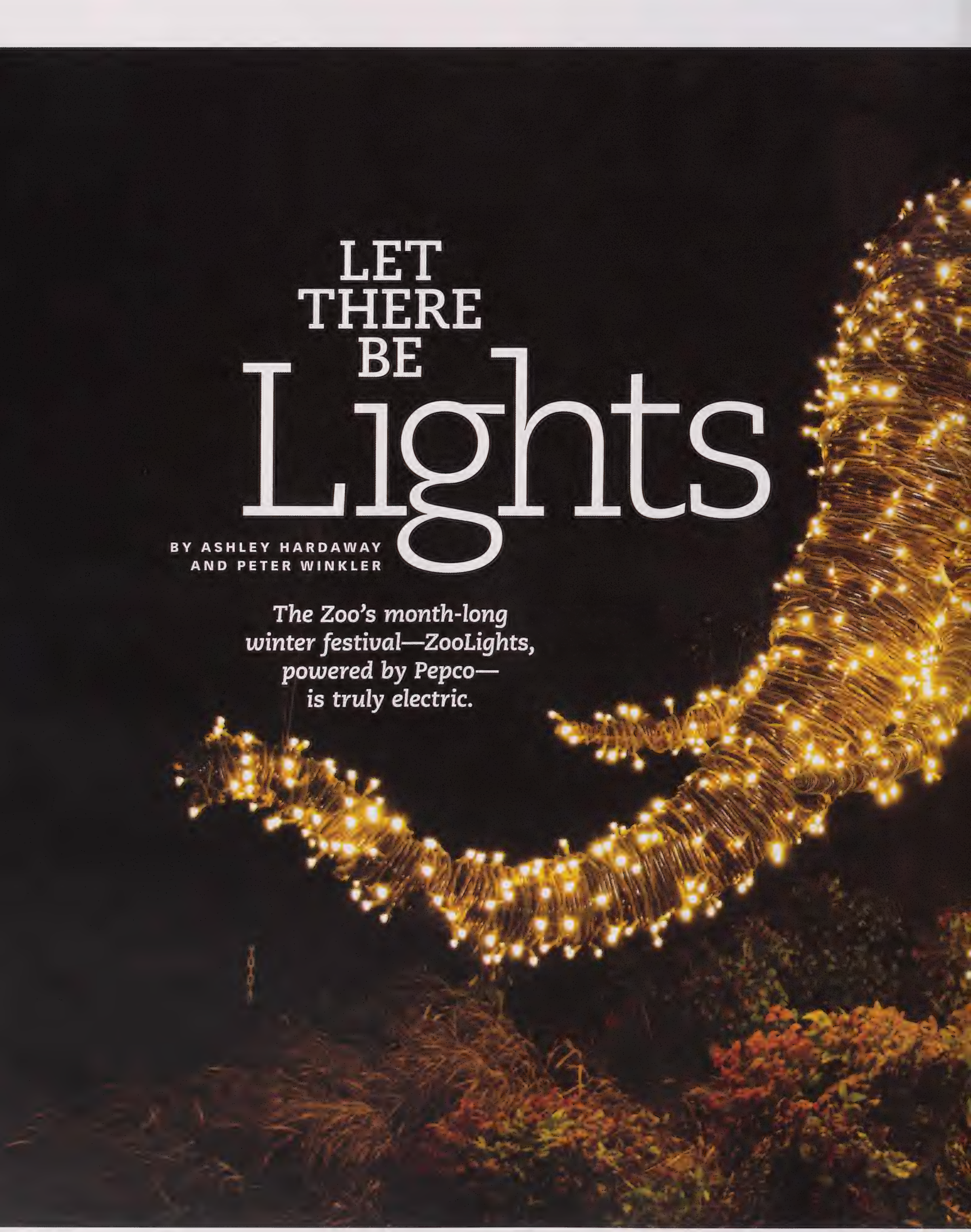
LET THERE BE Lights

BY ASHLEY HARDAWAY AND PETER WINKLER

The Zoo's month-long winter festival—ZooLights, powered by Pepco—is truly electric.



JIM JENKINS

Wintry winds and dwindling days seldom inspire visits to the Zoo. But early sunsets do bring one big benefit. Winter's dark evenings provide the perfect backdrop for the Zoo's sparkling, twinkling, fun-filled winter festival: ZooLights.

"It all began with a question," says FONZ executive director Robert Lamb, who spearheaded the initiative to bring about ZooLights. "How do we attract more visitors to the Zoo in the winter months?" That question—part of a larger conversation among Lamb, then Zoo director John Berry, and others—ultimately led FONZ to reach out to other zoos with a different question: How do you encourage visitation during the winter doldrums?

One word came up over and over again—lights. A growing number of zoos, FONZ discovered, were wooing visitors with yuletide light displays. Might that work in Washington?

To learn more, a FONZ team traveled to Ohio's Toledo Zoo, which hosts a Lights Before Christmas festival each year from mid-November through New Year's Eve. It includes the lighting of an 85-foot-tall spruce, rides, strolling carolers, ice-carving demonstrations, and a chance for kids to sit on Santa's lap. Each year, the event attracts approximately 130,000 people.

The FONZ emissaries returned enthusiastic—and a bit daunted. Mounting an electrical extravaganza, Toledo had taught them, is pricey. FONZ couldn't do it alone. So who could help?

LET THERE BE Lights

A Powerful Partner

In search of assistance, Jackie Vinick, who manages FONZ's corporate partnerships, reached out to a firm with no small experience at turning on the lights: Pepco, the utility company that provides power to more than 793,000 residents in D.C. and Maryland. In June 2007, a team of Pepco executives came to the Zoo to learn more about this partnership opportunity and how their interests align with the Zoo's education and conservation efforts.

The meeting was a success. Pepco signed on as lead sponsor for the Zoo's new holiday festival, soon dubbed ZooLights, powered by Pepco. The utility's unwavering support ever since has enabled the event to thrive and grow. The first ZooLights, orchestrated at breakneck speed during the second half of 2007, drew 30,000 visitors. Ticket sales during the event's first few years helped FONZ recoup its significant start-up costs.

As ZooLights matured, the FONZ events team stayed in touch with other zoos to share ideas about ways to help the festival flourish. Conversations with Chicago's Lincoln Park Zoo led to a paradoxical realization: Making the event free could actually boost revenue! That's because attendance would rise, and visitors would spend money on parking and concessions.

After long and hard thought, FONZ decided to adopt this new strategy in 2010. The team—embodied by Panda Claws, a costumed character who roamed the city—spread the word far and wide that ZooLights was now free. Washingtonians got the message. Eighty thousand of them came to see the lights, doubling attendance from earlier years.

The event's popularity continues to soar. In 2011, ZooLights drew 133,000 people. Last year brought 178,000. The festival has become one of the area's leading holiday attractions. "I'm talking to more and more people," observes Dan Pierron, who heads the events team, "who don't just come to ZooLights once a year but are visiting multiple times."

These Little Lights

This year's event, the largest yet, will feature some 530,000 small LED lights. Many of these Earth-friendly bulbs will go into the vibrant animal displays that form the heart of ZooLights. Visitors will wander through a gleaming world, whose radiant inhabitants range from anteaters to zebras.

Other wee lights will illuminate the branches of painstakingly wrapped trees, turning Olmsted Walk into a winter wonderland. More will become ingredients in one of ZooLights' signature attractions—the "dancing trees" whose lights flash in sync with holiday music.

Putting all those lights in place is an elephantine undertaking that requires 3,000 hours of labor. Crews of about eight people begin work in mid-October and press on until Thanksgiving.

One of the greatest ZooLights challenges, Pierron explains, is inclement weather. "With all those strings of lights, there are thousands of electrical connections that are sensitive to any kind of moisture." Protecting them from rain and snow is a key task for ZooLights planners and setup crews.

Come the new year, it takes another 3,000 hours to return the Zoo to normalcy. And the events team wastes no time drawing on lessons from the just-finished festival.

"Walking through the Zoo during the event," says Pierron, "we hear what people are saying, so we know what we did right and wrong, along with what we need to do more of. These are the people we do this for, so their opinion is the one that really counts."

Like the festive season itself, ZooLights has evolved to offer a smorgasbord of treats. Visitors ride the National Zoo Choo-Choo and the Speedwell Conservation Carousel (for which Pepco Energy Services donated solar-power equipment). The more adventurous go "snow tubing" down 150-foot-long tracks on Lion/Tiger Hill. Those are just a few of the possibilities.

Then there are the special nights, tailored for particular audiences. Date Night woos couples with chocolate and champagne. Military Night salutes those who serve with special discounts and giveaways. Young Professionals Night puts specialty drinks and networking opportunities on the agenda.

Each year, elves from FONZ's merchandising group transform the Visitor Center into a holiday haven. Its charms include elaborate train displays, Zoo-themed gingerbread creations, warm drinks, and tasty snacks.

Last year's centerpiece was a scale model of the Smithsonian Castle, crafted from 45,000 Lego bricks by Todd Butler. This breathtaking creation was such a hit that it now resides in the Children's Room of the actual Castle on the Mall. This year will bring eye-popping 3-D animals crafted out of paper by artist Andy Byers.

A Perfect Partnership

Pepco's stalwart support of ZooLights is a high-voltage example of a win-win situation. "Our event title—ZooLights, powered by Pepco—couldn't be more fitting," says Jackie Vinick, FONZ's corporate partnerships manager. "While Pepco literally powers the event, they also provide the invaluable funding and support that make ZooLights possible. They are a true partner in every sense of the word." Pepco's support, Vinick notes, has included helping FONZ find manufacturers who could produce eco-friendly light displays and recruiting employee volunteers to work as greeters during the event.

Debbi Jarvis, Pepco's vice president for corporate citizenship and social responsibility, shares Vinick's enthusiasm. "We're extremely proud," she says, "of the partnership we've created with Friends of the National Zoo. From the very beginning, Pepco has been the lead sponsor of ZooLights.

"Over the past seven years, I've had the opportunity to work closely with National Zoo and FONZ officials and watch ZooLights grow into a major event that showcases energy efficiency by using LED lighting during the holidays. Now LED lights are commonplace. At Pepco, we're very proud to continue working with FONZ on delivering this important conservation message."

The Best Part?

"One of the best parts of ZooLights," says Pierron, "is that it's become a holiday tradition for so many people in the area. The events staff is very proud to have been a part of making that happen."

Identifying a single most-popular part of the event is just about impossible, Pierron notes. "If you asked a hundred people what their favorite part of ZooLights is, you wouldn't get the same answer twice. I think it's because there's so much to see and do. Every time you turn a corner, you are surprised by something new." SZ

— ASHLEY HARDAWAY *was a marketing writer for Friends of the National Zoo.* PETER WINKLER *is the editor of* Smithsonian Zoogoer.

Zoolights is FREE every night from November 29, 2013, to January 1, 2014 (except for December 24 and 25).

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LEFT: **Thousands of D.C. and area children delight at ZooLights every year.**
BELOW: **A rainbow-colored display of LED lights greets visitors at the entrance of the Zoo during ZooLights.**

JIM JENKINS

THE *Queen* OF CANIDS

BY CRISTINA SANTIESTEVAN

Big ears. Long legs. Sharp teeth. And a taste for fruit?

KELLIE DOUGHERTY

"The first time I saw a maned wolf, it was love at first sight," says Nucharin Songsasen, research biologist at the Smithsonian Conservation Biology Institute (SCBI) and head of the Zoo's Wild Canid Project. Songsasen arrived at SCBI in 2002. Maned wolves were her first assignment, and remain her favorite challenge.

Long-legged and red-furred, maned wolves are native to the grasslands and scrublands of Brazil, Argentina, Bolivia, Paraguay, and Peru. They have the stature of a wolf, the appearance of a fox, and the scruffy half-formed mane of a teenaged lion. "They just look magnificent to me," says Songsasen. "I call them the Queen of Canids."

Like No Other

Maned wolves are not the wolves of our childhood fairy tales. Their legs are longer than Red Riding Hood's nemesis, all the better for walking through tall grass. Their ears are larger, all the better for hearing mice and other small animals while on the hunt. And their teeth are flatter, all the better for munching on fruits and berries when available.

In fact, beyond the name "wolf," very little about this species matches our perception of how a wolf should look, act, or eat. Maned wolves live mostly solitary lives, eschewing

the packs and family units that all other canids (dogs, wolves, and foxes) build their lives around. They sport the size of a wolf, but favor a diet more like that of a small fox with an abnormal taste for fruits and berries. Even the way they reproduce is unusual. "They are not wolves or foxes," says Songsasen. "They are their own thing; their own unique animal."

Challenging Canid

More maned wolves live at SCBI than any other Association of Zoos and Aquariums (AZA) institution, and each one of them is a mystery. From their reproduction to their diet, nothing about maned wolves is simple. Few people are more familiar with the day-to-day mysteries of managing maned wolves than SCBI keeper Ken Lang, who has been working with maned wolves since 1978, three years after the wolves first arrived at SCBI. "This is a species we've had nearly 40 years," says Lang. "You would think after that many years of study, we'd have this species figured out. But we don't. There just always seem to be new challenges."

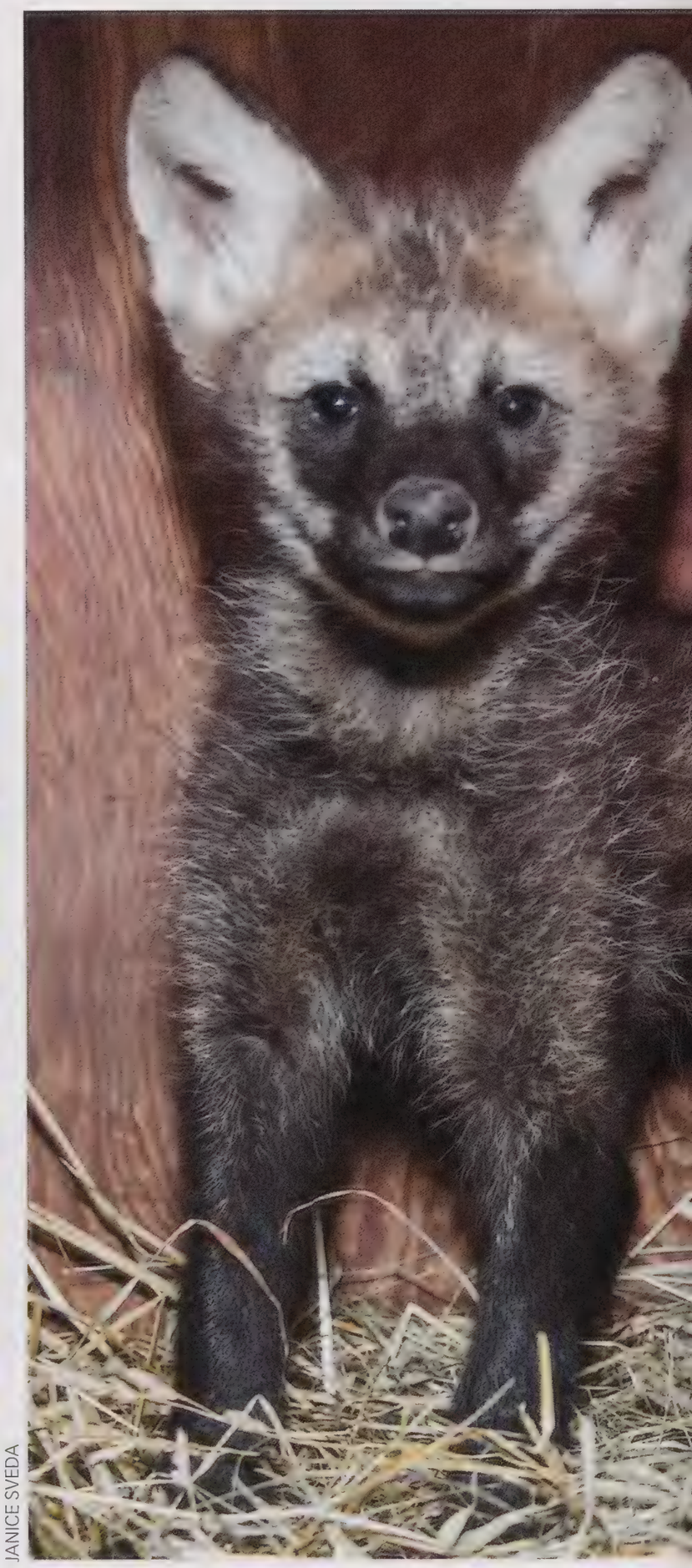
Scientists suspect that some of these challenges are inherent to the species. Others are linked to the maned wolves' solitary lifestyle, which is unique among canids. Even their diet of small mammals, birds, and fruit is likely somehow traced back to this life of solitude. "We don't know what came first," says Songsasen. "Do they have to eat something small that one individual could find because they are solitary? Or are they solitary because they eat small things?" It's a chicken-or-the-egg question turned canid: Which came first? The diet or the lifestyle?

At present, that remains a question without an answer; one of many within the world of maned wolves. In truth, the reasons behind their diet are likely less important than the consequences of it. Unlike most other canids, maned wolves cannot be fed a simple diet of meat; fruits are simply too large a part of their natural diet. "Their diet varies among seasons," explains Songsasen. "During the dry season, they eat more mammals because there is not a lot of fruit. But, in the rainy season, when fruit is plentiful, sometimes you see their scat just filled with seeds." In total, approximately half of the maned wolves' natural diet may be composed of South American fruits and berries. And there's the challenge: Many of those fruits and berries simply are not available in the United States.

Perhaps it's for want of some native fruit, or maybe it's just a genetic quirk of the species, but many zoo-kept maned wolves suffer from a condition Songsasen equates to IBD (inflammatory bowel disease). "Each wolf is different," says Songsasen. "Some wolves have no problems. Other wolves require a special diet."

In an effort to find an answer, maned wolf keepers and researchers initiated an AZA-wide experimental diet program two years ago. The diet consists of a standard kibble—maned wolf chow, essentially—supplemented with a variety of different vegetables, fruits, meats, and more. "Some zoos give their wolves this purée of lettuce and tomatoes and apples and all sorts of things," says Lang. "Another zoo might offer venison. We offer our wolves a number of fruits." Papaya

LISA WARE/NZP


JANICE SVEDA

FROM LEFT TO RIGHT: **A trio of maned wolf pups explore their yard at the Smithsonian Conservation Biology Institute; The two pups born at SCBI in 2013 were the result of the first attempted late-season breeding; Mother maned wolves will care for their pups until they are old enough to fend for themselves, which is generally at about one year of age.**

is a current favorite among SCBI's 15 maned wolves.

The dietary experiment is nearing the end of its second year. "I wish I could say it's been a miracle cure, but we do not have significant evidence of that yet," says Melissa Rodden, SCBI information technology specialist and coordinator for AZA's maned wolf Species Survival Plan (SSP). "We are still in the early stages of data analysis, so there are no firm conclusions at this point." After nearly two years of feeding this experimental diet, biologists are now beginning to test maned wolf blood samples for levels of amino acids, minerals, electrolytes, and more. Those results will help Rodden and others determine the next steps with maned wolf dietary management. Ultimately, they hope to develop a standard diet that maximizes maned wolf health throughout the AZA population.

Beyond the name "wolf," very little about this species matches our perception of how a wolf should look, act, or eat. Maned wolves live mostly solitary lives, eschewing the packs and family units that all other canids (dogs, wolves, and foxes) build their lives around.

The challenges with maned wolves don't stop with their dietary quirks, although they may start there. Maned wolves are also notoriously difficult to breed. According to Rodden's SSP records, only 15 of 72 recommended pairings produced surviving pups in the past four years. Some of the unsuccessful pairs produced pups that died in their infancy. Others appeared to breed, but produced no pups. "We do not always know if a pair bred or not," explains Rodden. "They can be very sneaky."

Bit by bit, researchers and keepers are finding answers that increase maned wolf reproductive success in captivity. Chief among these is the discovery that maned wolves are induced ovulators. This means the females do not release their eggs for fertilization until receiving some sort of environmental trigger, such as the odor of a nearby male.

"This is very unusual," says Songsasen, who explains that most canids are spontaneous ovulators. "But, it makes sense. If we look at the natural history of the species, these are solitary canids with big home ranges. And the females only come into estrus once a year, so this mechanism may help ensure reproductive success. If she only ovulates in the presence of a male, he won't miss her cycle."

Just last year, SCBI put this knowledge to work. A female maned wolf arrived late in the breeding season, and didn't

MEHGAN MURPHY/NZP

clear her standard 30-day quarantine until much later than any previous maned wolf breeding. Keepers and biologists debated about whether or not to try breeding her with the male recommended by the maned wolf SSP. Ultimately, Songsasen advised putting the two together. Because the female wolf had not been around any males earlier in the breeding season, Songsasen suspected she would not have ovulated. Songsasen was right. The wolves bred, and the female gave birth to two healthy pups on April 14, 2013.

The birth of those pups is significant, because it proves that AZA institutions can extend the maned wolf breeding season by keeping females separated from males, essentially pausing the females at a point where they are ready to ovulate as soon as they are put with a male. This gives zoos a larger window for transporting breeding pairs to new locations, and means that institutions in cold weather areas can intentionally delay their breeding season so that pups are born when the weather is warmer. "Thirty-five years with maned wolves, and this is the first time we've tried a late-season breeding," says Lang, who is excited about these new possibilities.

Songsasen hopes that another noteworthy celebration—the first successful maned wolf artificial insemination (AI)—may be just a few months away. "We are the only ones who have attempted AIs with maned wolves," says Songsasen, who explains that SCBI will be trying again this year with a female maned wolf who is too aggressive to breed naturally. "We haven't succeeded yet, but we're getting close."

MEHGAN MURPHY/NZP

The Temptation of Chickens

Maned wolves are the tallest and perhaps strangest of the canid species, but they are not the rarest. Not yet. At present, approximately 20,000 maned wolves live in the wild. However, Songsasen and others worry that their numbers are declining as agriculture expands through their historic range. "Most of these wolves live in unprotected areas, in direct contact with humans, dogs, and livestock," says Songsasen. "I would say that only 15 percent of their natural habitat remains. Eighty-five percent of their habitat has already been converted into coffee plantations, cattle ranches, and soybean farms."

The International Union for Conservation of Nature lists maned wolves as near threatened, and notes that the species very nearly qualifies as vulnerable. Every single one of the primary threats faced by maned wolves today can be traced back to the expansion of agriculture throughout their historic range. In addition to the direct loss of habitat, maned wolves are also threatened by the fragmentation of their habitat, which requires them to maintain larger territories and possibly travel farther to find suitable mates. Many wolves are killed by collisions with vehicles on the expanding network of roads. Farmers' dogs and livestock also pose a threat. Even chickens present a risk for maned wolves—they are the only livestock small enough to tempt the wolf and other native canids, and some farmers are countering predation with poison. Songsasen has already found the carcass of one animal—a crab-eating fox—that she suspects was the victim of poisoning.

"I would say that 70 percent of Brazilian farmers are fine with maned wolves living on their farms," says Songsasen, who explains that maned wolves are not generally vilified as wolves, coyotes, and foxes tend to be in North American farming communities. This goodwill disappears, however, if maned wolves or other native canids begin to develop a taste for poultry. Lucky for the wolves and the chickens, the answer may be very simple: chicken coops. As part of their field work in Brazil, Songsasen and her colleagues help local farmers design and build secure chicken coops. "If farmers put their chickens in coops at night, the predation rate goes way down,"

At present, approximately 20,000 maned wolves live in the wild. However, Songsasen and others worry that their numbers are declining as agriculture expands through their historic range."

says Songsasen. Sometimes, the answers really are that simple.

Dogs and Disease

Worse than the temptation of chickens and the threat of poison is the very deadly risk of disease. Farmers' dogs spread canine distemper, parvovirus, and parasites. Livestock also contributes to the parasite load. There may be no easy answer here. Preventing the spread of disease from domestic animals to wild animals requires more than a sturdy chicken coop.

Among all these potential diseases and parasites, parvovirus—also called parvo—is almost certainly a primary concern for maned wolf survival. Parvo is a highly contagious virus that attacks the cardiac and intestinal systems of affected canines. The virus is especially dangerous for pups. Of the adult wolves living on or near farms, nearly all test positive for the virus. And while parvo rarely kills healthy adult animals, it is nearly always fatal for pups.

This may be the reason behind one of Songsasen's more troubling field observations: "We see that pups are born both inside and outside protected areas. But, anecdotally, we only see parents with older pups in those protected areas. We never see any young running around in the farmland." Songsasen suspects parvo may be killing those pups, but she explains that proving parvo's culpability is nearly impossible. "We would need to find the carcasses of the dead pups in order to prove it was parvo that killed them."

All of these threats—poison, parvovirus, roadkill deaths—link back to the farms that are steadily overtaking the maned wolves' range. "It doesn't seem obvious that habitat fragmentation would affect wolves, because there are wolves living everywhere in this fragmented farmland," says Songsasen. "But, physiologically and ecologically, it is definitely affecting them. In the long term, habitat fragmentation could threaten the survival of the entire species."

Long May She Reign

Maned wolves, as a species, are facing challenges throughout their home turf and within their zoo populations. From Front Royal to Brazil and beyond, biologists, keepers, and researchers are banding together to find answers. Some of these answers may prove maddeningly complex. Others could be as simple as chicken coops and plywood tents.

"It was pure accident," says Lang, reminiscing about the first A-frame plywood structure he built. "We had a wolf in a yard that had no shade, so I made a tent out of some plywood lying around. The wolf went right into it." Seeing how readily the wolf adopted its new shelter, Lang and his fellow keepers began adding similar A-frames to other wolves' yards, often installing several in a single yard. "All of a sudden, we were having really good success with pups."

The A-frames work because they give female maned wolves a den-like space for her pups. Maned wolves do not dig dens. Instead, they raise their pups above ground, often relocating their litters several times before the pups are weaned. The plywood A-frames serve as surrogate den sites, and SCBI's female wolves took to them readily. Lang had only intended to give one wolf a bit of shade. In the process, he found an inexpensive and easy-to-implement solution to the problem of high infant mortality among zoo-kept maned wolves. Now, the plans for his plywood A-frame are included in the species' SSP manual, and other zoos have begun to add similar structures to their own maned wolf yards.

That unexpected result gives maned wolf enthusiasts hope for the future. "Somebody will stumble on something, and it will be an aha moment," says Lang. "You look at something like the A-frame. How simple of an idea could it possibly be? And, yet, we went years without them because we just didn't know. I wouldn't be surprised if the answers to these other challenges are just as simple." SZ

— CRISTINA SANTIESTEVAN *is a freelance science writer and photographer, and an editor for* Smithsonian Zoogoer.

Zoo visitors can see two maned wolves at the Cheetah Conservation Station.

SMITHSONIAN **zoogoer** kids CORNER

BEAST BITS

JEN ZOON/NZP

Ears With Something Extra

Red river hogs look almost like cartoon characters. They have wild colors, big round snouts, and hair sticking out all over. And then there are those ears. Big and floppy, they may help the hog look bigger than it is. That's handy for showing another hog who's boss or driving it out of one's territory. Long white hairs—called tassels—at the end of the ears help the hog brush bugs away from its eyes.

You can see a red river hog at the Cheetah Conservation Station.

JESSIE COHEN/NZP

Danger Dots

Bright orange markings make emperor newts stand out in their habitat, high in the mountains of China. They also warn predators that eating a newt is a seriously bad idea. That's because each orange dot marks a gland that can release poison. Even a drop can kill an attacker. Patterns like the emperor newt's are called warning colors.

You can visit an emperor newt at the Reptile Discovery Center.

Tiny creatures called corals have their stone-like skeletons on the outside of their bodies. Over time, coral colonies build huge, rocky structures called reefs.

fun fact

FRIEND OF FLORA

Craig Rudolph is the supervisory horticulturist at the Smithsonian's National Zoo. Every day, Rudolph is all over the Zoo: checking in with gardeners, meeting with keepers, and overseeing horticulture and irrigation issues. His work with plants improves the experiences of both animals and visitors alike.

After working an outdoor summer job in his hometown, Rudolph knew he wasn't interested in a desk job. So he graduated with a degree in landscape and nursery technology, and the knowledge that horticulture is about more than just planting pretty flowers. "Horticulturists are sort of doctors for plants, trees, and grass," says Rudolph. "We make sure that everything is getting enough food and water, and try to find out if something is getting sick."

Rise and Shine

The Zoo can get thousands of visitors a day. In order to beat the crowds, Rudolph starts his workday early. "My typical day starts at 6 a.m.," says Rudolph. "We have a short window of time to accomplish as much work as possible in animal exhibits and public areas before the park gets crowded." As supervisory horticulturist, Rudolph oversees the Zoo's five gardeners, two equipment operators, and various contractors, which means his mornings usually involve a quick check-in with them.

After that, Rudolph's day-to-day tasks vary. His duties include meeting with keepers to discuss plans for exhibit work, fixing any problems with the irrigation system, conducting park inspections, and making suggestions for new landscape designs. "Most of my day consists of running from place to place, checking in on different problems that pop up during the day," says Rudolph.

JOSE IRAHETA/NZP

Seeds of Advice

Being a horticulturist at the Zoo means Rudolph's work isn't just for people—it affects animals as well. "We use plants to provide some shelter within the animals' exhibits so they can feel safe and hidden," explains Rudolph. Making sure the exhibits are free of toxic plants or weeds keeps the animals healthy and is another important part of Rudolph's job.

If you're interested in pursuing a career in horticulture, Rudolph has a suggestion: learn to love the outdoors. Horticulturists work outside for long hours, so the weather can have a strong impact on your job. His other piece of advice? "Learn to identify poison ivy and poison oak early. Then you won't end up with a nasty rash."

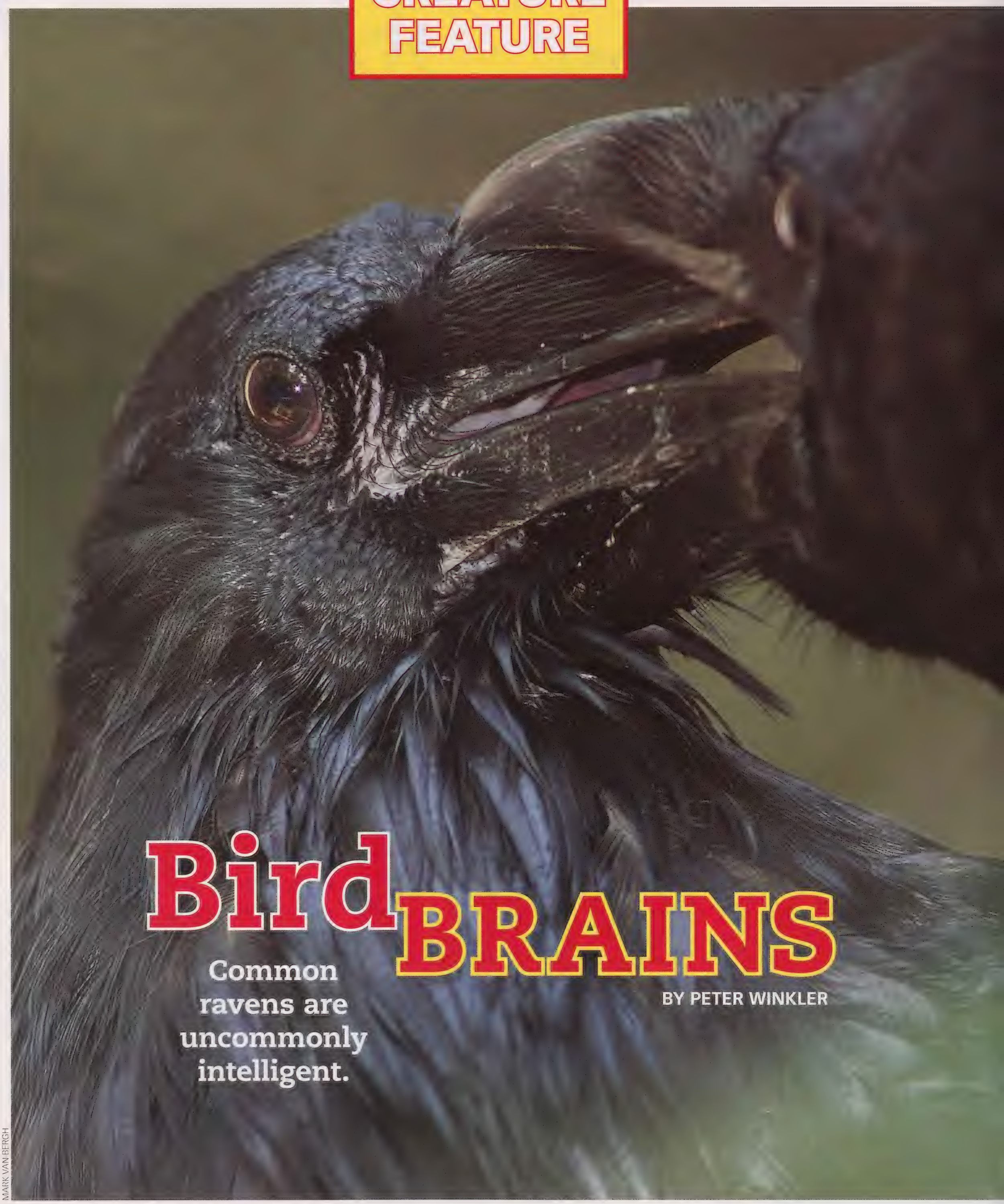
Best Office in the World

"One of the rewarding parts of being a horticulturist is when Zoo visitors take the time to comment on how lovely the grounds are and how proud we should be for all the hard work we put into maintaining the grounds," says Rudolph. It's fulfilling for him to know that horticulture has a positive impact on visitor experience.

But for Rudolph, the most rewarding part of the job is why he got into horticulture in the first place. "The thing I love most about horticulture is that I get to be outside just about every day, all day," says Rudolph. "I often tell people that I have the best office in the world—the outdoors."

— KATHARINE SUCHER

CREATURE FEATURE



Bird BRAINS

Common ravens are uncommonly intelligent.

BY PETER WINKLER

MARK VAN BERGH

Big BIRDS

Common ravens look like crows, and the two birds belong to the same family. Yet ravens are much larger. They can grow thirty inches long, and their wings can spread five or more feet across. These big birds can weigh nearly four pounds. American crows, in contrast, weigh just about one pound.

BASIC Black

Ravens found a color that suits them, and they stick to it. From head to foot, they're the color of night—black feathers, black legs, black claws, black beak. Even their eyes are ebony!

Not-so-picky EATERS

These midnight-mantled scavengers eat just about anything they can get: remains of dead animals, eggs, insects, reptiles, other birds, grain, fruit, and even people's garbage. Ravens sometimes follow wolves or cougars, hoping to swoop down and dine on the predators' leftovers. They also soar along highways, keeping a sharp eye out for roadkill.

SMART Moves

Common ravens are no birdbrains. They impress scientists with their ability to solve problems and use tools. And they sometimes team up in search of food. One raven will dive down toward a nesting seabird, distracting it. Then another black bandit sneaks in and grabs an egg or a chick.

Fancy FLIERS

Acrobats of the air, common ravens dive, roll forward and backward, loop through the sky, and even fly upside down. These flying feats may be a way to woo mates or to rise in the pecking order. Then again, they may be just for fun. Ravens sometimes entertain themselves by dropping sticks, then racing down to catch them.

ALMOST Everywhere

Common ravens live throughout the Northern Hemisphere. They're not picky about habitat, living in forests, grasslands, deserts, coastal areas, tundra, and other biomes. The one ecosystem they don't seem to like is the rainforest. Ravens often live near people, feasting at landfills and garbage dumps.

At the ZOO

Wing your way along American Trail or swoop by the Bird House to meet the first ravens ever exhibited at the National Zoo.

YOUR TURN

Tricky Tales

Native peoples of the northwestern United States admired ravens' intelligence. Their myths included stories about how a raven stole fire from the sun and shared it with humans, and how ravens dropped salmon into rivers to provide food for humans and animals.

Think of your favorite animal and see if you can find any tricky tales about it. Let us know what you learn at **zoogoer@si.edu**.

FONZ RESOURCES

fonz.org

Member/Donor Information
202.633.2922

Special Events
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Comments? Questions?
Please email us at
fonzmember@si.edu

Not a FONZ member yet?
Call 202.633.2922
or go to
fonz.org/join

NEW!

Snow Glow Birthday Parties

Join the party animals for a winter wonderland birthday during ZooLights at the Smithsonian's National Zoo! Children turning 6-12 years old will celeBRIGHT and explore the Zoo with expert tour guides. Snow Glow Birthday Parties are available during ZooLights on Fridays and Saturdays from 6 to 8 p.m.

Register online: **fonz.org/birthday**

PLAN AHEAD: Priority registration (Premier+ members only) for 2014 birthday parties begins October 29. All member registration begins November 5. Birthday parties are a FONZ member exclusive!

COMING IN 2014!

Night Owl Overnights

Whoooo is stirring when the sun goes down? Come spend a wild winter night at the National Zoo and learn about the creatures that lurk in the shadows. After an evening of science experiments and activities, enjoy a bedtime snack before hibernating indoors. Have a light breakfast and then head out on a sunrise tour of the Zoo with your nature guide.

Night Owl Overnights are for scout groups and birthday parties for children 6-12 years old. Available Saturday evenings from January through March. Whoooo will be the first to join the Night Owls? Learn more online: **fonz.org/nightowl**

A Wild Nature Exploration for Children in Grades K-5.

Snow Safari campers will explore the lives, habitats, and conservation of animals around the world. Each four-day session includes exciting hands-on activities, craft projects, science experiments, and walks through the Zoo. (Please note: There is never direct contact with the animals.)

There's snow doubt about it! Snow Safari Day camp is the coolest way to spend your winter vacation!

Grades K-1:

Cool Critters

Mittens and scarves keep humans warm, but how do animals prepare for winter? Play games and make crafts in our cozy classroom as we explore how the animal kingdom gets ready for the big chill. Then zip up your jacket before investigating further on snowy walks through the Zoo to see the gray wolves, giant pandas, and brrrrds!

Frosty Fauna

The Zoo is always buzzing with excitement—even in the winter! Come out of hibernation and meet our bears, lions, tigers, and more. Learn about your favorite frosty fauna through Zoo walks, science projects, and purr-fect crafts. This camp is sure to be Zoo-riffic!

Grades 2-5:

Winter Wild

Do you have what it takes to survive the long, cold winter? Learn some special survival techniques from our resident animals who love the snow. Brrrave the cold to meet experts in the field of animal science and species survival, and discover the important work they do. Then find out how you can protect wildlife at home.

AGES: Grades K-5.

DATES/TIMES: December 30, 2013, through January 3, 2014, from 9 a.m. to 3 p.m. No camp January 1. Before- and after-camp care also available.

FEES:

Snow Safari (9 a.m. - 3 p.m.): $305 members / $382 non-members

Before-camp care (8 - 8:45 a.m.): $80

After-camp care (3 - 6 p.m.): $140

Registration begins October 29 at 10 a.m. Register online: **fonz.org/camps**

ABBY WOOD/NZP

MEHGAN MURPHY/NZP

HOW DO YOU ZOO?

Let your imagination run WILD!

FONZ staff will help you explore zoo careers in this interactive play space. Test your skills by completing tasks in four pretend settings within the exhibit. Complete research, become an animal chef, examine animal x-rays, and take care of business as a zoo keeper. Pass your training and become certified Junior Zoo Staff. Each child will receive a participation patch!

Learn more and register online: **fonz.org/howdoyouzoo**

AGES: 5-10

DATES/TIMES:
November 5 at 10:00 a.m.
November 9 at 1:30 p.m.
November 19 at 10:00 a.m.
November 23 at 1:30 p.m.
December 3 at 10:00 a.m.
December 7 at 1:30 p.m.
December 17 at 10:00 a.m.

FEE: $18 per child. Minimum ten children per program. We require one adult chaperone for every five children. Chaperones are free.

TIME: 90 minutes

ADULT EDUCATION: WILDLIFE STUDIES CERTIFICATE PROGRAM

FEE: $130 (FONZ member), $162.50 (non-member)

November: Birds without Borders

With Dr. Chris Tonra, post-doctoral research fellow at the Smithsonian Conservation Biology Institute

The open sky has no boundaries. Yet twice a year hundreds of species of birds make an aerial trek across states and countries following an intrinsic map toward seasonal nesting grounds. Join us for a deeper look into the world of migratory birds. We will study their ecology and distribution, and learn how to identify local species.

This three-part course will be offered Tuesday evenings and may have a field trip component. Learn more and register online: **fonz.org/adultclasses**

December: Reptile Cognition

With Lauren Augustine, keeper at the Reptile Discovery Center

Far too often our scaly counterparts do not get the recognition they deserve. But snakes, lizards, crocodiles, and the like are intelligent and aware with an intuition all their own. They can be taught and trained to perform activities as successfully as their hairy or feathered comrades. Join us as we explore the realm of reptilian sense and perception.

This three-part course will be offered Wednesdays in December. Learn more and register online: **fonz.org/adultclasses**

MEHGAN MURPHY/NZP

Don't forget to use your member coupon code when registering for camps and classes!
Use the coupon code **SLOTHBEAR2013** through 2013.
The coupon code will change to **ELEPHANT2014** at the New Year.

STAN COLLYER

Worth the Wait

The camera and lens grew heavier and heavier as Stan Collyer stood by the howler monkey enclosure in the Small Mammal House earlier this year. After half an hour, his arms "were about to give out."

As if on cue, Heliodoro, a baby howler, bounded into the shot. He climbed aboard his mother, Chula. "After a few minutes of nursing and grooming," Collyer says, "they struck this pose and made my day!"

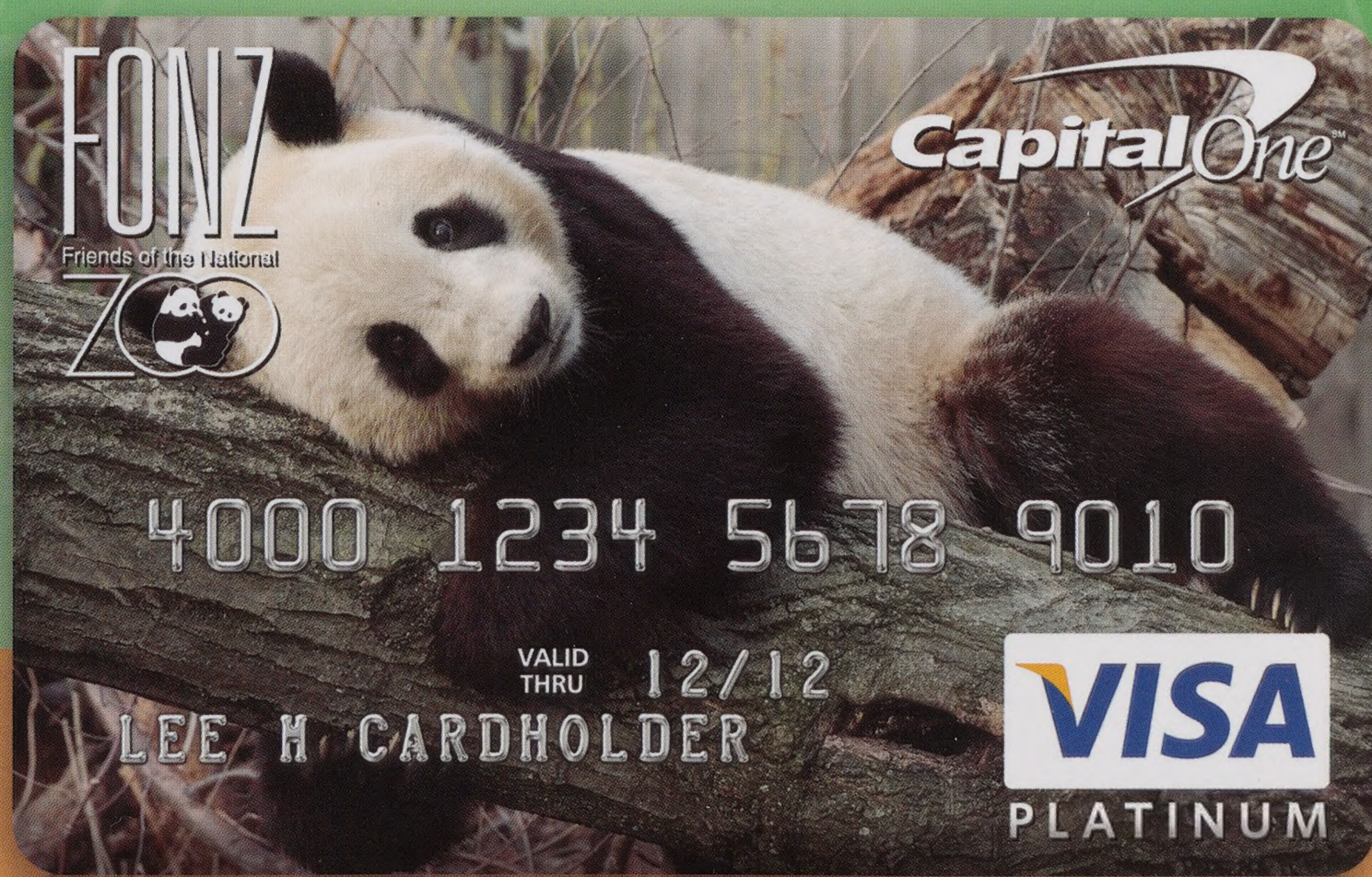
Technical Notes —
CAMERA: Canon 5D MK III; EXPOSURE: 1/60 sec at F/2.8;
FOCAL LENGTH: 168 mm; ISO: 400

Smithsonian Zoogoer welcomes FONZ members' submissions of photos taken at the Zoo. Please send photos to **Zoogoer@si.edu**. We will contact you if we are able to use your picture for the Zoo View page.

Join the Club!
Membership in the FONZ Photo Club is open to photographers of all skill levels. The group meets monthly to hear guest speakers and to share and discuss members' work. Learn more at **fonz.org/photoclub**.

SAVE ANIMALS, EARN REWARDS

SHOW YOUR SUPPORT FOR **FONZ** AND EARN 1.25 MILES FOR EVERY $1 SPENT



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Smithsonian
National Zoological Park

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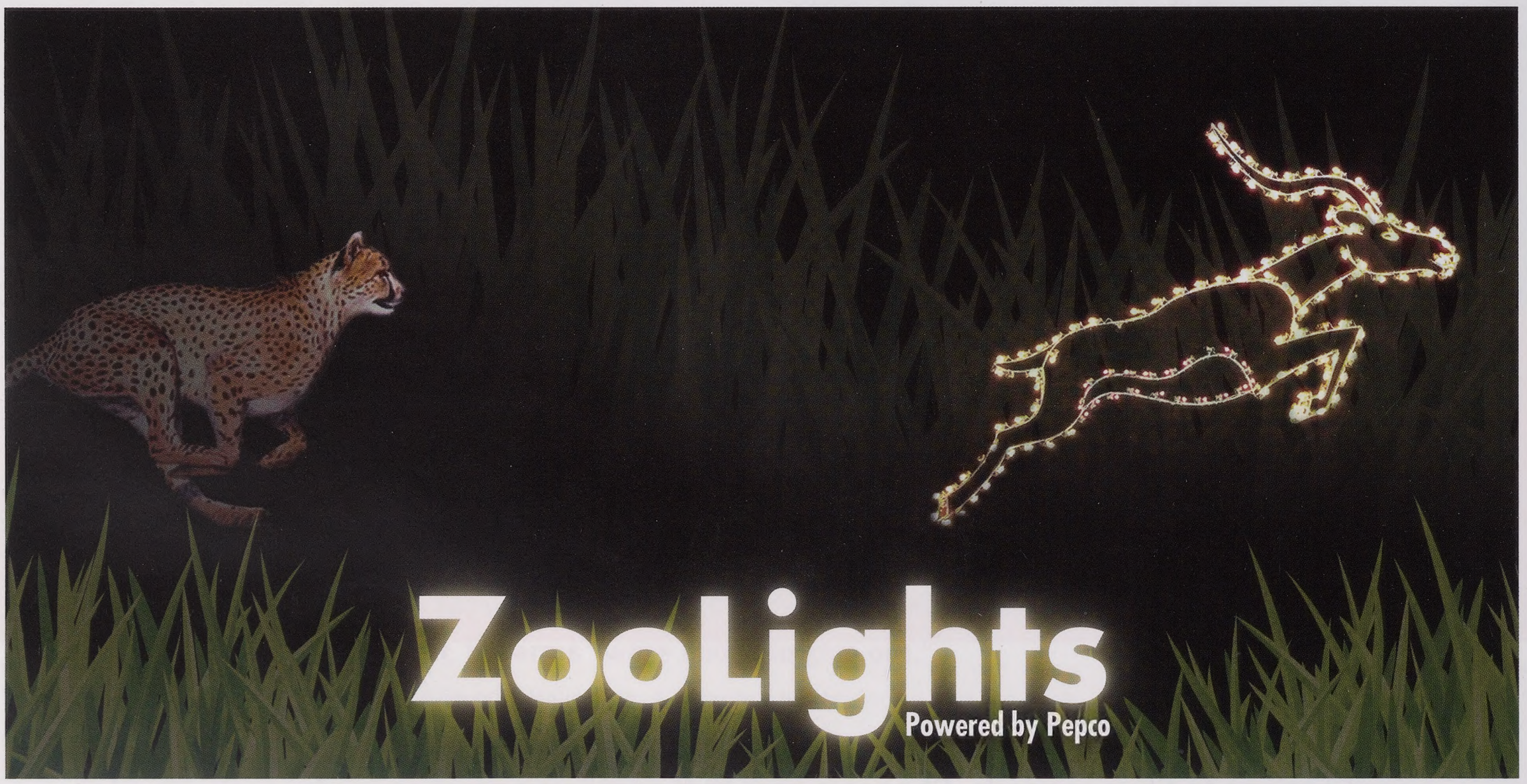

See the Smithsonian's National Zoo in a whole new light! Come to ZooLights, a free event that starts the day after Thanksgiving and runs through New Year's. Take a whirl on the Speedwell Foundation Conservation Carousel, plunge down "snowless" tubing tracks, ride the National Zoo Choo Choo, enjoy hot cocoa and cider, and stop by the Visitor Center to see the Lego village and trains. And of course, the lights. Half a million twinkling, sculpted, and dancing lights all combined with festive music in the unique setting of the National Zoo. **Go to fonz.org/zoolights for details**.

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